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AMERICAN FORESTS

EDITOR
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Lilian Cromelin
Erle Kauffman

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THE AMERICAN FORESTRY ASSOCIATION

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Washington, D. C.

The American Forestry Association is a citizens' organization for the advancement of intelligent management and use of the country's forests and related resources of soil, water, wildlife and outdoor recreation.

Its educational activities seek to bring about a better appreciation and handling of these resources, whether publicly or privately owned, that they may contribute in the highest degree to the welfare of the nation and its people.

In addition to publication of two magazines — AMERICAN FORESTS and CONSERVATION, both designed to keep before the people of the country important conservation questions and issues, the Association carries on educational projects in various fields including forest fire prevention, reforestation, protection of fish and wildlife, upstream flood control, prevention of soil erosion, preservation of wilderness areas, establishment of national forests and parks, development of forestry by private endeavor, the teaching of conservation in the schools of the country, promotion of research in timber growing and use and expansion of markets for forest products.

The Association is independent. It has no connection with any federal or state governments. It is non-political and non-commercial. All its resources and income are devoted to the advancement of conservation. It has been so operated since its founding in 1875. All citizens interested in forestry and conservation are eligible for membership.

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BIG TREES

The American Forestry Association is sponsoring a national hunt for the discovery and preservation of the largest specimens of the different species of typical American trees. Locate, measure and nominate your candidates in this competition. ACT NOW to make known and save the largest specimens of America's trees. For further details, see page 412 of the September issue or send for special announcement of this Big Tree hunt. Mail your nominations with records and pictures to The American Forestry Association, 919 17th Street, Northwest, Washington, D. C.

GIANT SYCAMORE--PRIDE OF THE MUSKINGUM VALLEY

STANDING staunchly on the almost perpendicular river bank, and leaning far out over the water, is this great sycamore — nominated as king in its class by H. E. Frye, of Lowell, Ohio.

It is on the left bank of the Muskingum River, slightly below the head of Danas Island, two miles below Beverly and Waterford and easily seen from State Highway 77.

With a circumference of 42 feet 7 inches and a diameter 9 feet 6 inches, it is estimated to be 800 years old. The main branch forked about 18 feet from the present ground surface, which is many feet below the top of the river bank shown in the picture. Exact measurements of the branches are on record. This grand old tree is an entry of which Ohio may well be proud.

THE BEVERLY SYCAMORE

BEAT FIRE TO THE PUNCH!

• DESTROYING flames may never threaten this growing forest. But if they do there'll be a good road ready for the crews and trucks that go in to fight the fire.

The best protection for American forests is the network of strategic roads, trails and fire-breaks now being steadily extended by the Forest Service. And if one machine is more responsible than any other for this modern protection, it's the "Caterpillar" Diesel Motor Grader.

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Who's Who

Among the Authors in this Issue

Grace Kirkpatrick

GRACE KIRKPATRICK (*Across Northern Barriers*) first started writing as a hobby, in 1927—publishing the stories she had for years been telling her children. She had published over three hundred of these stories before she took up writing as a profession. Since then her work has appeared in leading travel and sports magazines, trade and business papers. Her love for travel and writing about it grew out of extended trips to England and South Africa in early years, and now the family's hobbies—she is the mother of a grown boy and girl—are devotion to their dog, long motor trips and sleeping under the stars in some forest camp.

BEN EAST (*Three Legs Are Enough*) is a native of Michigan, one of her best known outdoor editors, and a militant conservationist. He began writing in this field about twenty years ago, and spends much time afield with his camera. Here he writes the appealing story of "George," a fawn handicapped from birth in a most unusual way—and how he has risen above this handicap.

SAMUEL N. BAXTER (*Why a Street Tree Census*) has for thirty years been arboriculturist in charge of landscape gardening at Fairmount Park, in Philadelphia.

Roderic Olzendam

RODERIC M. OLZENDAM (*We, the People, and Our Forests*) is a New Englander, and a vice-president of The American Forestry Association. Educated in the public schools of the Granite State, he was graduated from Trinity in New York and the University of Vermont, majoring in commercial and economic science. Widely traveled in this country and abroad, he has written extensively. His ensuing business experience as industrial advisor for several of the largest pulp, paper and insurance organizations in the United States eminently fitted him for his present job as director of public relations for the Weyerhaeuser Timber Company, of Tacoma, Washington, with its great forest holdings.

G. H. LENTZ (*This Is Forestry*), silviculturist, professor and forest engineer, is a Yale man, class of '17. Attached as silviculturist to the Southern Forest Experiment Station in Louisiana, he later became Planting Chief of the Tennessee Valley Authority, with headquarters at Knoxville, Tennessee, where he made outstanding erosion studies. At present he is regional forester at the Washington Office of the U. S. Forest Service.

Science Service
Edmundo Navarro

EDMUNDO NAVARRO DE ANDRADE (*An Alien in Brazil*) has been, since 1903, Chief of the Forest Service of the Paulista Railroad, one of the larger railroads of Brazil. The world's leading authority on eucalyptus, he has devoted his life's work to its culture and tells here the almost unbelievable story of the naturalization and establishment of this alien tree in Brazil. Aside from his many notable contributions to agricultural science, Dr. Navarro has found time to serve his country in many official capacities and is now President of the Technical Committee on Raw Materials in the Defense Commission of Brazil. On June 2nd, Dr. Navarro was awarded the Meyer Medal for distinguished services in plant introduction, by the American Genetic Association.

A. G. SIMSON (*Radio on the Fire Line*), radio engineer, has been intrigued with radio and working with it since 1908. He entered the U. S. Forest Service in 1923, specializing in radio research, and in 1931 changed over to the field of radio development, at which he has been busy ever since.

A. G. Simson

THE COVER—Bow Lake (see lead story), superbly set, and source of the Bow River—is one of the many gleaming gems strung on the highway threading the eastern throat of the Rockies. Above is glittering, spectacular Crowfoot Glacier, clinging to the mountainous walls of Banff National Park. Photograph by the National Parks Bureau, Canadian Department of Mines and Resources.

SEVERAL bills now pending in Congress, each designed to bring about some form of public control over the cutting of timber from privately owned forest lands, make timely a restatement of the position of The American Forestry Association in respect to this much discussed question.

Broadly, opinion has divided three ways. One group holds that regulation of the many thousands of individuals and companies which own forest lands should be by the respective states and implemented through existing state forestry departments. Another group holds that the regulatory power should be invested in the federal government and exercised through the U. S. Forest Service of the Department of Agriculture. A third group opposes as unnecessary and unworkable the idea of bringing about better cutting practices on forest lands by legislative fiat and holds that greater progress will be made through voluntary cooperation on the part of owners, states and the federal government.

As respects these three views the position of the Association set forth in a policy statement adopted by the Board of Directors on October 20, 1939, supports the principle of state control with federal aid and cooperation. The Board's resolution, which was printed in the December, 1939, number of this magazine, follows:

"The American Forestry Association believes that private forestry will progress most rapidly on lands where the owners are sufficiently convinced of its value to adopt sound methods of management of their own accord. There will always be some owners, however, who do not fall into this class and whose mismanagement of their lands jeopardizes the public interest.

"In order to meet this situation the Association favors the use of the police power to the extent necessary to safeguard the interest of the general public. Most states now make use of that power to require private owners of forest land to take certain steps to reduce the fire danger, and a few prescribe how the timber shall be cut.

"The Association believes that as the next step forward the regulatory power should be used by the states as rapidly as public opinion is sufficiently favorable to promise its effective enforcement to require that all forest lands not to be converted to some other use be so handled as to maintain them in a productive condition. Such a requirement would permit of complete flexibility in adopting methods of management best suited to individual properties, would not affect the practice of progressive owners, would constitute a reasonable restraint on others, and is the minimum necessary to safeguard the interest of the public in the perpetuation of an essential natural resource."

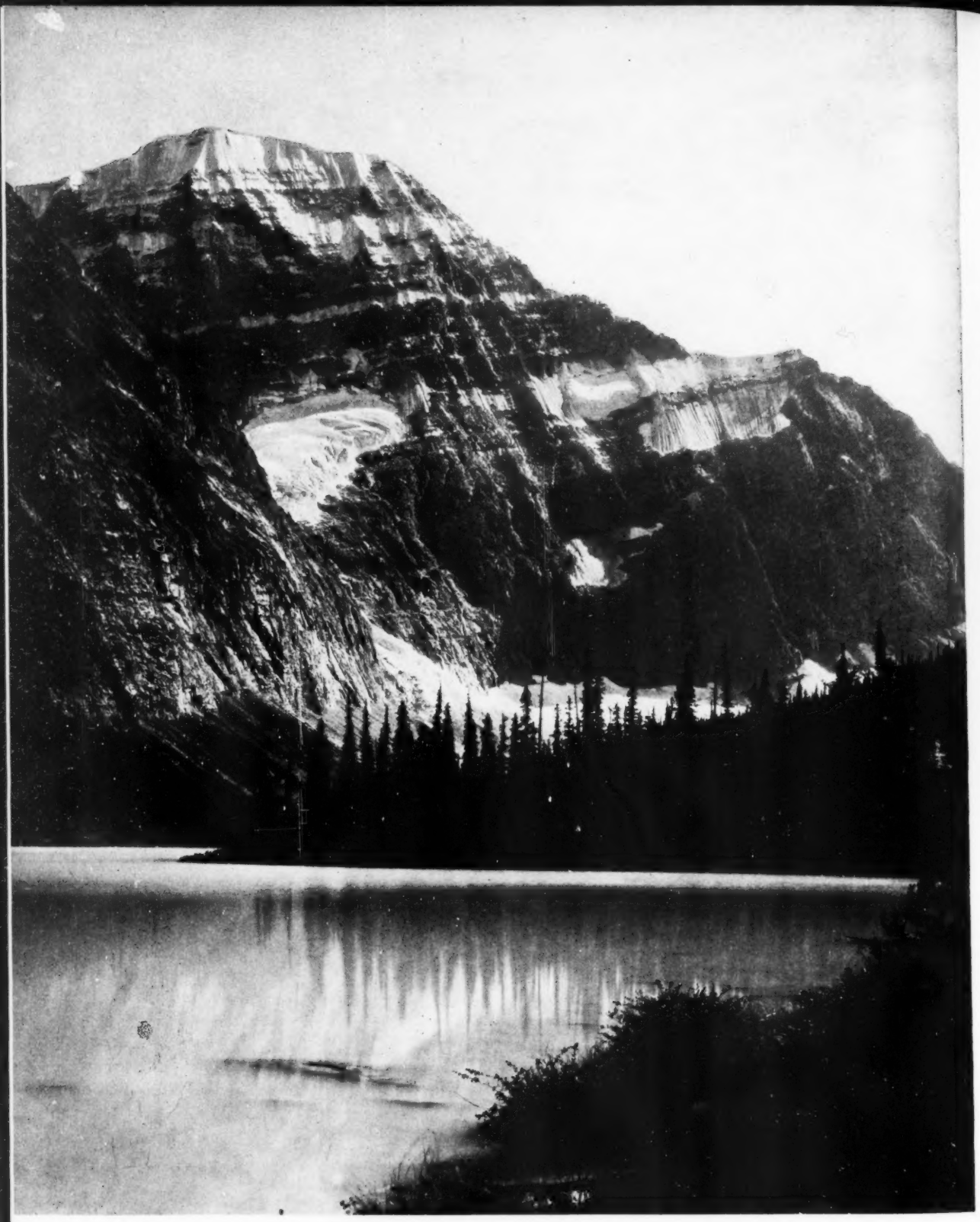
* * * * * *

"PREVENT FOREST FIRES—IT PAYS" ought to be engraved on a hundred tombstones in the town of Marshfield, Massachusetts. In common with other eastern states, Massachusetts has been subjected this spring to an abnormal scourge of forest fires. The heaviest loss in that state, it is reported, fell upon the town of Marshfield, which has refused to provide funds for even simple forest fire protection measures. Retribution came this spring when a million and a half dollars of the town's taxable property, or about one-fifth of its tax base, went up in smoke.

In graphic contrast is the adjoining town of Duxbury, which for years has maintained a forest fire protective organization. Through patrols and light equipment strategically distributed so that any fire can be reached within five minutes after it is reported, the town has virtually fire-proofed its land and other property values. Its claim is that over the last twenty-five years the average area burned over within the town has been less than one acre annually and that no single fire has exceeded three acres.

Ovid Butler

Editor.



Here is glory indescribable — Mt. Edith Cavell in Jasper National Park. At its foot the peace of trees — the green of virgin forests mirrored in the waters of one of the countless lakes forming crystal links in the route the new highway follows

The last barrier is down. The pack-train has made way for the motor car and part of the "Athabasca Trail" is now a broad highway, winding through wilderness on all sides—the Jasper-Banff road has been completed. This curve, above Sunwapta Canyon in Jasper Park, reveals beautiful Mount Athabasca and the glacier

Across Northern Barriers

Completion of Jasper-Banff Road Provides Inspiring Canadian Trip for Wilderness-loving Motorists

By GRACE KIRKPATRICK

Photographs by National Parks Bureau, Canada Department of Mines and Resources

THERE are roads ready to a new land.

Not west, not east, but along the Great Divide, a road to the birthplace of the northern rivers.

The Jasper-Banff road takes you along the range of the Canadian Rockies; the western link of the Trans-Canada Highway takes you over them. These roads command wilderness on every hand; forests unchanged; a country of which Arthur Conan Doyle wrote:

"I have seen the gorge of Erie where the roaring waters run,
I have crossed the Inland Ocean, lying golden in the sun,
But the last and best and sweetest is the ride by hill and dale,
With the packer and the pack horse on the Athabaska Trail."

The Athabaska Trail! Here passed the fur brigades. Here pioneers crossed the mountains and knew that their eyes were among the first to view the valleys, virgin forests, rocks and rivers, lakes and plunging falls.

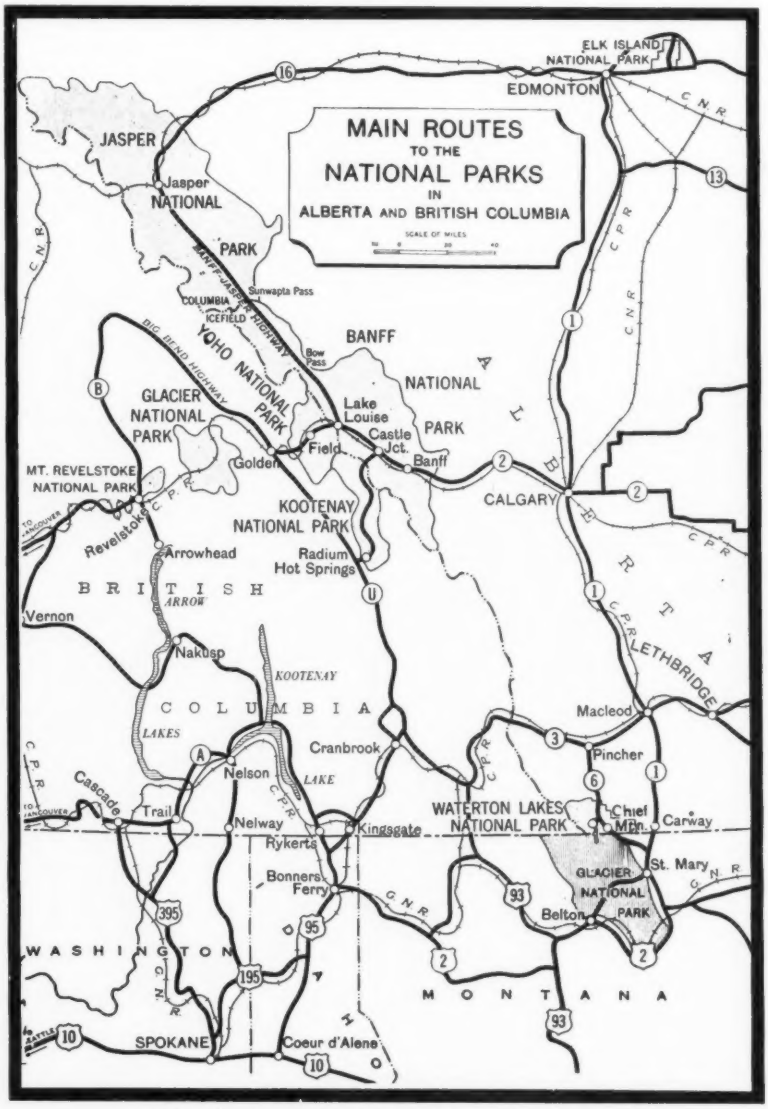
Well, the last barrier is down.

The pack train has made way for the motor car; the pack trail has become a broad highway. We were standing actually on the traces of what once was the lone and dangerous path of adventurer and trader across the far reaches of the northern Canadian Rockies.

Perhaps you know the Alpine town of Banff, headquarters of Banff National Park, with its famous resort, its streams of fish, its mountains, its beautiful government gardens. You leave the town at an elevation of 4,500 feet and follow the beautiful Bow River valley.

The road for the first thirty-seven miles, from Banff to Lake Louise station, is common to both the Banff-Jasper and the Trans-Canada highways. This stretch is not new but it is beautiful — magnificent by day and of indescribable glory under the light of a moon. There is a story that engineers seeking a route for a railroad across these Canadian Rockies despaired of finding a pass and were about to declare the road not feasible, when they sighted an eagle soaring through the seemingly impenetrable wall. They took new courage and after more hardships they at last found the flyway gap that only the birds knew.

A short distance before reaching Lake Louise, the Banff-Jasper Highway leaves the route of the Trans-Canada Highway and turns sharply to the right and north. One hundred and eighty-six miles of new land lies ahead, all of it within national park boundaries, for Banff and Jasper parks join. Until this road was built they were formidably separated. The Surveys and Engineering Branch of the Department of Mines and Resources in conjunction with the Lands, Parks and Forests Branch of the same Department of Canada, built the highway. The minimum road width is eighteen feet but the actual travel way is generally wider. The average maximum grade is eight per cent and it does not reach ten per cent anywhere. Weather conditions, it is expected, will permit tourist use of the highway from about the first of June until the middle of October. Facilities for the public are being provided, ranging from picnic grounds with outdoor fireplaces to bungalow camps and modern chalets.



Map showing main points of interest and the new highways now linking Canada's greatest national parks

Lakes, sky-blue in their waters; lakes that mirror the green of the virgin forests; lakes that are stirred and silver grey under the breeze — one after another they add crystal links in the route the highway follows.

There is Bow Lake which is as blue as waters can be, with the crystal whiteness of a glacier coming to one shore, a green and sunny meadow meeting the waters on the other bank. There is spectacular Crowfoot Glacier; fascinating Peyto Lake and Glacier—and everywhere vistas of snow-capped peaks rising tier on tier to the sky.

Following the valley, looking up at the peaks, then climbing to traverse the backbone of the continent, this road seems worthy of the description given it as the most spectacular scenic highway of North America. The task of building it was great because of its remoteness. Owing to heavy snows, building operations were largely restricted to summer months. The most difficult stretch to construct was a series of switchbacks from Sunwapta Pass to the canyon below. For seven miles the road builders had to hang onto sheer rock walls to dynamite out a roadway. While work was carried on from both

ends, not more than seventeen miles could be graded and surfaced each year.

The builders' task, however, is over. In spite of the great altitude of the Canadian Rockies, the road has none of the terrors sometimes associated with mountain highways. For the most part it follows the valleys and looks up at the peaks. Where it does not, the grades by which it climbs are easy, the curves smooth and sweeping.

Ascending from the North Saskatchewan Valley is the pass that actually crosses the Atlantic-Arctic watershed. Here is the "Big Hill," presenting an abrupt rise of over one thousand feet. The new highway overcomes the height by circling around the shoulder of Mount Athabaska with several long, flat switchbacks, ascending gradually to the higher altitudes; then around the eastern edge of Mount Athabaska and on to the top of Sunwapta Pass at an altitude of 6,675 feet.

You are now indeed among the monarchs of the continent: Nigel Peak, Mount Athabaska, Mount Columbia, Mount King Edward, Mount Kitchener, and Snow Dome where the rivers are born. Eleven of the twenty-one highest peaks in the Canadian Rockies here tower above the route of travel. On Snow Dome rise the streams and glaciers that flow into the Athabaska and northward to the Arctic. Here also is the source of the North Saskatchewan that follows its course to Hudson's Bay and thence to the Atlantic; and the mighty Columbia River to the west gathers up the Rice and Bush Rivers that rise in the ice fields of Snow Dome and presents them to the western seas.

The highway here is within a hundred feet of Athabaska Glacier that flows out of the famed Columbia Ice Field, the largest body of ice south of the Arctic Circle. Columbia ice field is estimated to be two thousand feet

Crossing the last barriers to the roof of the continent — in the left background is part of Mt. Aberdeen, over ten thousand feet high; Mt. Leroy and glacier, over eleven thousand feet, and part of Victoria Glacier. Mirror Lake, on Beehive Mountain, is the small one in the foreground and a bit of Lake Louise is to be seen at the extreme left, beyond the forest

thick and it extends over one hundred and fifty square miles.

Within a few hundred yards of the glacial cap and of the comfortable chalet which looks out upon the ice field and where steaming tea, buttered toast and marmalade is served, the writer saw something that fascinated her as much as anything seen on the entire trip. It was a pool of water perhaps a yard or so long. Perfectly calm and very dark, it rested in a hollow in black, cold soil. It was a tiny bit of water with a threadlike trickle from each end.

This was the birthplace of the rivers about which stories have been written. The trickle from one end of this little pool later became the Saskatchewan River that finds its way to Hudson's Bay and so to the Atlantic. The few drops of water slipping from the other end by some mysterious force yielded to the urge to turn north to become the Athabaska and finally plunge into the Arctic Ocean.

Leaving the ice wastes, the quiet pool, the remote chalet, our course led due north into the valley of the Sunwapta, the Indian name for "river of the whirlpool." The Sunwapta flows into the storied Athabaska and its turbulence seems comparative calm, after reaching the roar and turmoil of Athabaska Falls.

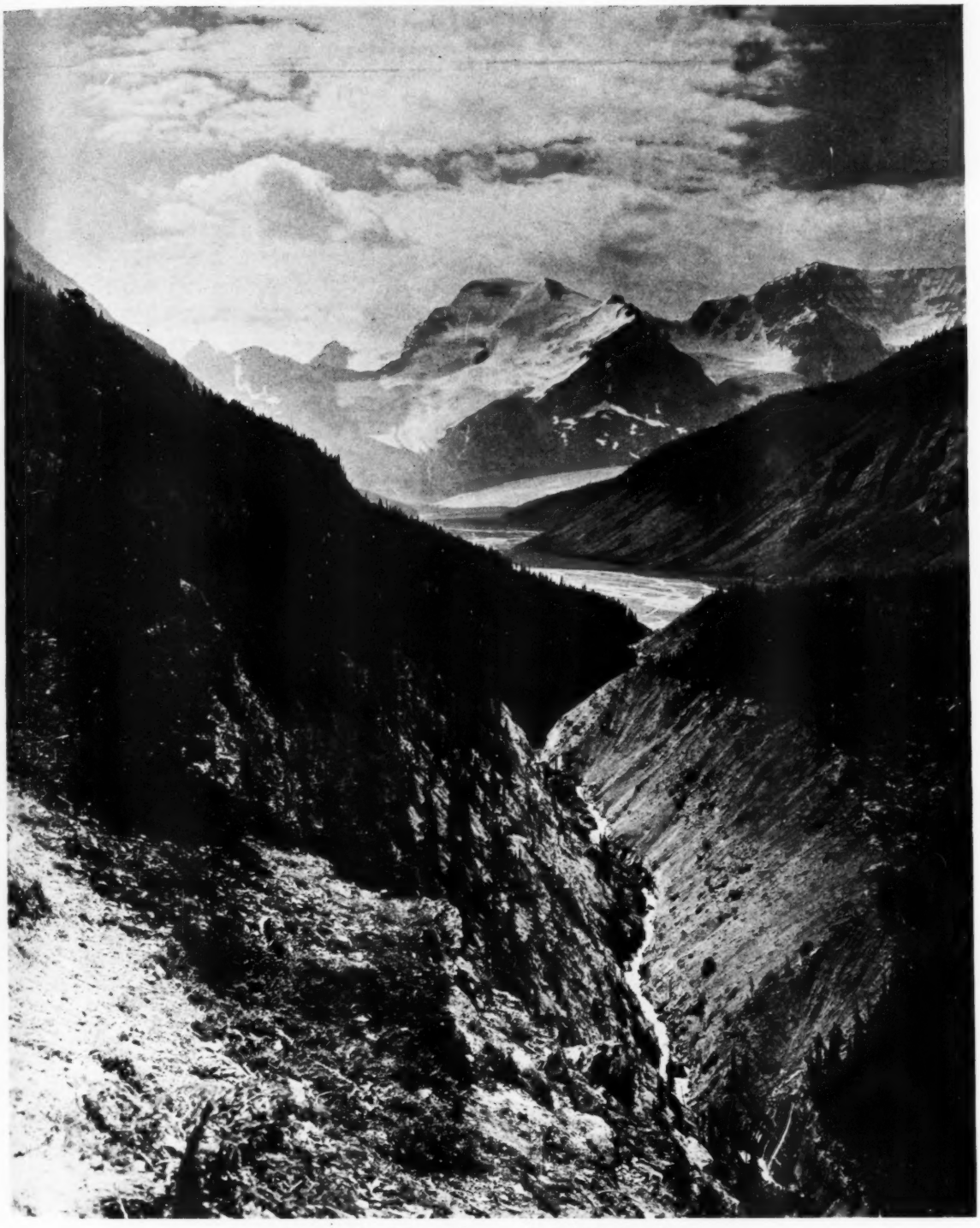
We saw deer, elk and moose at various places along the way but it was on a cliff above the Athabaska that we saw our first bearded mountain goats—five of them, following each other in grandfatherly style up the sheer white rock. In this region, also, a mountain sheep ventured so low from the jutting crags as to cross the highway seemingly unperturbed by our oncoming car.

Wildflowers grew close beside the road and up the banks on all sides. They were in great profusion—an Alpine lily, beargrass, Indian paintbrush, and forget-me-nots. The last grew with unusually long stems. Trailing luxuriantly through the grasses, they added a delicate touch to the entire beauty.

"TRAIL TO ATHABASKA PASS"—a sign announces. This part of the Jasper Road was the main route for the fur brigades of the Canadian northwoods to the Pacific Coast. David Thompson, explorer for the old Northwest Fur Company, crossed here in 1811; Sir George Simpson, governor of the Hudson's Bay Company, and his party pushed through in 1825; over the Athabaska Pass from the Pacific came Gabriel Franchere and Ross Cox from Astoria, John Jacob Astor's trading post at the mouth of the Columbia.

The new road, leaving Banff at an approximate elevation of 4,500 feet, makes a gentle ascent—usually eight and never ten per cent in grade—up the beautiful Bow Valley toward Lake Louise. This splendid vista is the approach to Mt. Fryatt along the Athabasca River

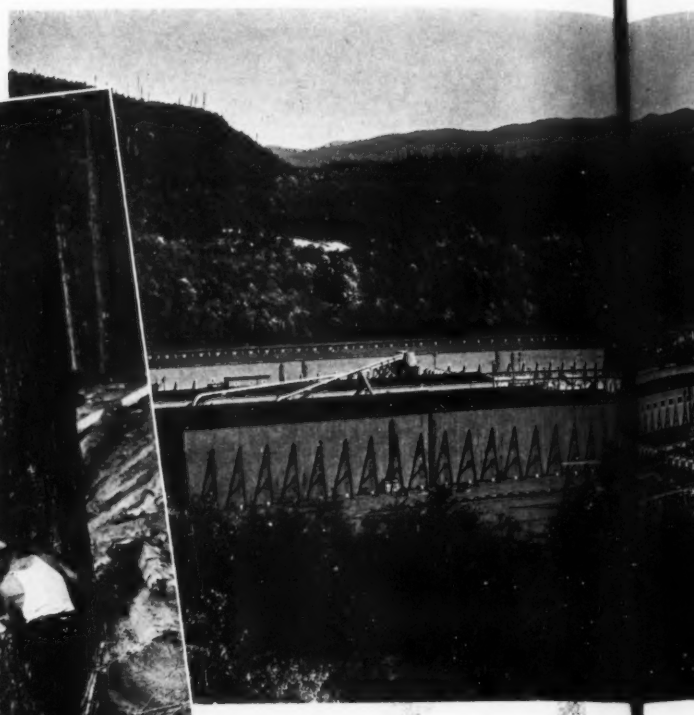
The actual route of the highway north from Banff and Lake Louise was first traveled by Dr. (later Sir James) Hector, a member of the Palliser Expedition sent out from England in 1857 to discover a suitable travel route across British North America. Dr. Hector ascended the Bow River Valley in 1858 to Bow Lake and Bow Pass,



Among the monarchs of the continent — the heights where the rivers are born. Straight ahead rises Mt. Athabasca, above Sunwapta Canyon, — ". . . the last and best and sweetest is . . . the Athabasca Trail"

and continued down into the Mistaya River Valley to the North Saskatchewan River. After a trip up the Howse River to Glacier Lake, which he discovered, he went down the Saskatchewan.

The town of Jasper is the heart of Canada's largest national park, named fittingly for Jasper Hawes, a trader who kept a post for the North West Company on the Upper Athabaska in 1817. Until 1940, Jasper stood alone, cut off by a sea of mountains, impenetrable except by sad- (*Continuing on page* 350)



The objective of We, the People, says the a... keep Am... continuously. Out of the harvesting of these ... (left) ... families at a high standard; capital (above) ... an adequ... its money; men of transportation (right) ... handle...

WE, THE PEOPLE AN...

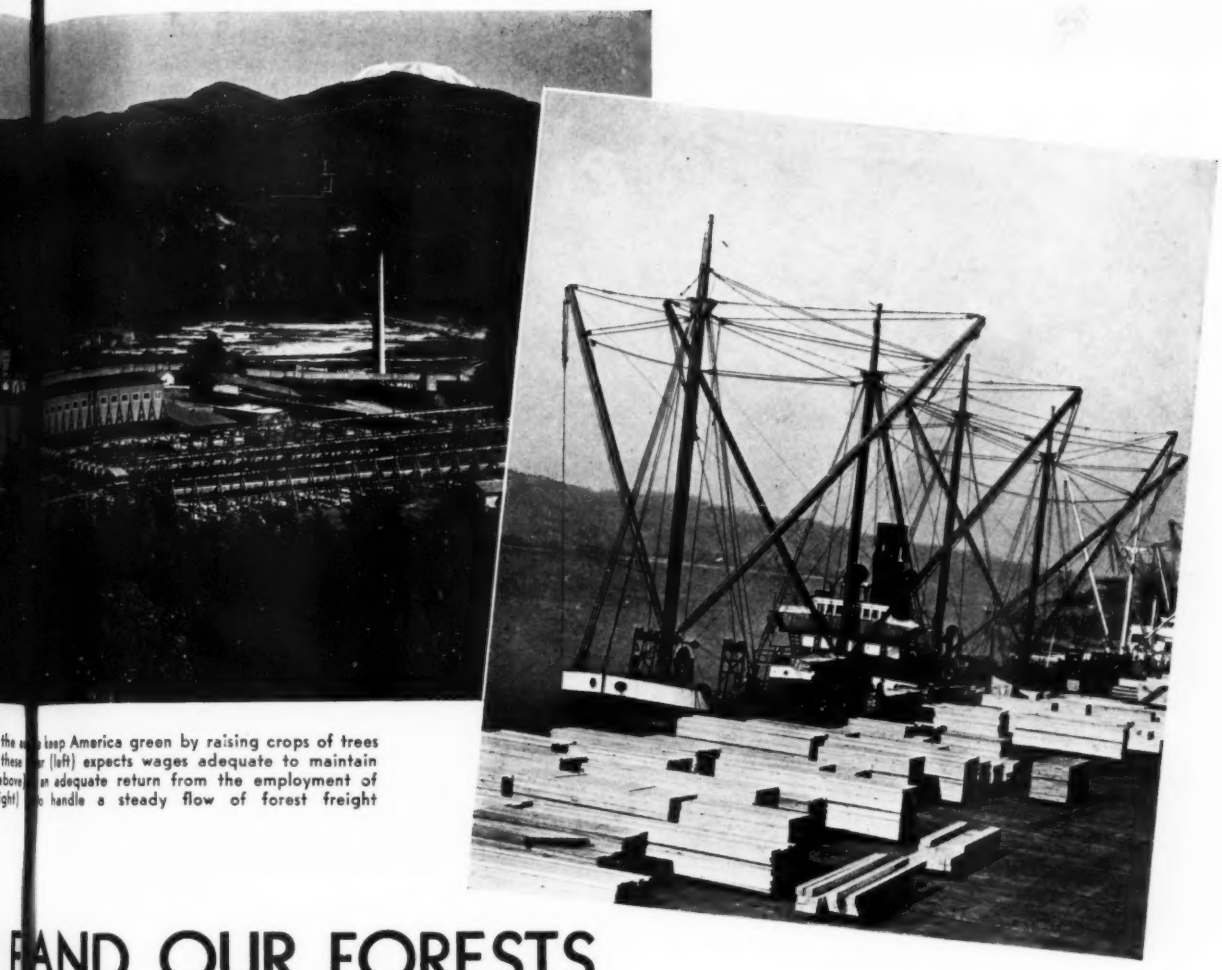
By RODE... ZEND...

Photogr... K. S. Bro...

SINCE 1776, we, the American people, have logged, manufactured and shipped enough forest products to build 50,000,000 homes, 12,000,000 farms, 2,000,000 schools and libraries, 600,000 churches, 400,000 factories, and to create billions of newspapers, magazines and books. These institutions, fashioned from trees, are today the cornerstones of an unbeatable American democracy. It is these very forest-born institutions that we are ever ready to defend. It is from these institutions that men draw the most powerful weapon of defense—the will to defend. And so it can be said that the conservation of men and the conservation of trees promotes national defense in peace and in war.

The American program for the conservation of men has proceeded more rapidly in the last twenty years than anywhere else on earth. The conservation of trees has proceeded more rapidly than we, the people, allow ourselves to admit. A quick glance at our national tree picture will help, I believe, in getting at the core of this matter. One-third of our total land area is tree land—land on which the tree crop is second in value to our agricultural crops. And yet, we, the people, through our sins of omission and commission, have shoved the subject of the management of our trees up to a high peak from which the view is very smoky. Our ears crackle with the babble of talk rising up from all sides. We can hear representatives of privately owned forests, talking; we can hear representatives of numerous departments of the federal government, talking; we can hear the representatives of forty-eight state governments, talking; we can hear literally a multitude of voices mounting up from thousands of clubs, associations, institutes and committees, all charging themselves with the responsibility of solving the forest problem of America, with a special finger pointing in the direction of the Pacific Northwest. We are all talking, all talking at once.

Now, the men of the forest industries are out to earn a decent living by furnishing the American people with uninterrupted supplies of forest products, whenever they need those products, in peace or in war. We do not claim to be the possessors of any more or any less foresight than the men who catch and can salmon, or who enact



keep America green by raising crops of trees
r (left) expects wages adequate to maintain
an adequate return from the employment of
o handle a steady flow of forest freight

AND OUR FORESTS

ZENDAM

K. S. Brown

and repeal laws, or who dig and sell coal. To quote the general confession in the Episcopal Church prayer book —we, along with most men, "have left undone those things which we ought to have done, and we have done those things which we ought not to have done." And then again, when we read the things that some people say of us, and when we hear their continuing voices we, quietly and in confidence, turn to the old Scottish prayer book and repeat softly to ourselves—"from ghoulies and ghosties and long-legged beasties, and things that go bump in the night—good Lord preserve us." But, seriously, we do feel that unless all of us are honestly interested in getting a clear view of the forest situation, are willing to sit down together, like American business men facing a complicated business problem, regardless of what we do for a living, then we are liable to wander off together aimlessly.

We, the men of the western states, are convinced that this tree problem is moving in the right direction, not spectacularly, but solidly, surely towards solution. And that, we feel, is the important thing. Therefore, we should dissolve the smoke of talk which is swirling up and blotting out the clear view that we know perfectly well is there. This can be done by extinguishing the explosive fires of thought which are touched off by some people who know what they are talking about, and by some people who do not. I propose that we put out these fires by drenching them with a solution made up, half of the cold water of facts, and half of the acid of American perspective.

We, the people, have a personal forest objective. Each of us wants to do something definite about our trees. But do we really know in our own minds what we want, or is it rather vague and beautiful, a sort of yearning to do something big and clean?

During the past twenty-five years I have worked and traveled many miles in this and other countries and I have talked to hundreds of men in woods and mills, with men in government and men in private offices. We have talked about trees and men. And so, for purposes of our thinking together, I would like to venture a unified forest objective—an objective to which I believe we

The Washington "Post"

From the original forests which our pioneering forefathers faced, we have manufactured millions of tons of pulp with which to make paper to carry news and knowledge to our expanding population. We have cut 450,000,000 poles with which to convey our messages and our voices from home to home; 6,000,000,000 cords of wood with which to warm ourselves

can all agree. I would put it something like this:

Timber is a crop, and the objective of all persons interested in the forests of our nation is to keep America green by raising crops of trees continuously. Out of the harvesting and converting of these trees into forest products we, the people, have a right to expect certain reasonably balanced results.

Those of us who call ourselves "labor," in return for the use of our skills and muscles, expect to earn and receive steady wages, adequate to maintain us and our families at a high standard of health, decency and enlarging knowledge. Those of us who answer to the name of "capital" expect to earn and receive adequate wages in return for the steady employment of our money and our brains. We, the people who are "the state," expect steady revenue from the harvesting of forest crops in the shape of fair taxes for the support of efficient, democratic government. We, the "men of transportation," expect to handle a steady flow of freight from the forests by rail and by water. We, "the tourists," expect to have the opportunity to camp and relax under the trees for the revitalizing of our bodies and our souls. We, "the sportsmen," expect to hunt and fish among the trees regularly. And finally, we, "consumers," expect to purchase promptly at fair prices a steady flow of forest products for national defense in peace and in war.

War Department

Since 1776 we have taken from our forests more than 2,200,000,000,000 feet of timber with which we have laid the cornerstones of American democracy—homes, farms, schools, libraries, churches and factories. Today millions of trees are going into the defense of this democracy—in cantonments, for example, as shown above to house our growing Army

These, I suggest, are the things we, the people, expect from the harvest of our tree crops. It is evident that balance and perspective must govern the handling of this long-range crop. If either labor or capital expects and takes too much out of the transaction, or if the state expects and takes too much, then the whole thing is thrown out of balance and we, the people, will not get what we have every right to expect from the tree harvests.

Direction is important. Does it appear that the forest industries are moving forward or backward or sideways or standing still? We, the people, ought to know for sure. I believe the majority of men in this

industry want to do their reasonable share toward carrying out this unified objective.

We, the people of Oregon, have enacted a forest-conservation-for-use law, a very forward-looking law, which places us in the front rank of forest states. We are determined to keep Oregon green by carrying out the policy that timber is a crop. We, the people of Washington, are united in a state-wide movement to keep Washington green. Forest legislation was introduced in Washington at the last session of the legislature, but it failed to pass. We, the men of the forest industry in Washington, have agreed unanimously among ourselves to carry out the principles of such a law voluntarily. We are doing this because abundant experience has taught us that it is right—right for us, and right for everyone else concerned.

We, the People, the author points out, have a gigantic tree farm of nearly 500,000,000 acres of commercial forest land which, under sound forest practices, with fire kept out, can supply the nation with abundant annual crops of trees for all time. Such a tree farm, in the Douglas fir region of the Pacific Northwest, is shown above—young trees growing on land which has already contributed greatly to our comfort and security

What have men of the forest industry to show for themselves? First, a backward glance using what facts are obtainable, reveals the following over-all 165-year national balance sheet for the forest industries: Since 1776 we, the American people, have taken from our forests 2,200,000,000,000 feet of timber with which we have laid the cornerstones of American democracy—homes, farms, schools, libraries, churches, factories and paper. From the original forests which our forefathers faced, we, the American people, have cut some 6,000,000 cords of wood with which to warm ourselves and cook our bacon; we have manufactured millions of tons of pulp out of these trees, pulp with which to make paper to carry news and knowledge to our expanding population. We have cut 450,000,000 poles and 11,000,000,000 posts from these forests with which to convey our messages and our voices from home to home, from office to office, and to keep the cows from wandering down Main Street. We have harvested from these forests 10,000,000,000 railroad ties to grip the steel which has bound the East to the West and the North to the South—steel which has united us in one great nation.

These forest products, these renewable materials, valued at billions of dollars, have done more to strengthen our democracy than any other raw material. They have brought shelter, and warmth, and beauty, and news, and knowledge, and employment, and places to work and places to worship, and places in which to train our men and women for the defense of our institutions. These are the uses to which man has put the forests of a nation these past 165 years.

And because timber is a crop, we have a gigantic tree farm of 495,000,000 acres of commercial forest land, which farm, under sound forest practices, with fire kept out, can supply the nation with abundant annual crops of trees for all time. In addition to commercial forest

lands managed for us by our federal government, we have 125,000,000 acres of state and federal forest playgrounds. There are 99,000,000 acres—twenty per cent of our commercial forest land—on which loggers have never yet shouted "Timber! Down the hill!" Timber is in truth a crop.

On 313,000,000 acres we now have a second crop of trees, some of them merchantable and some of them just youngsters. These are crops to be protected, harvested, converted and transported by the sons and the grandsons of our present loggers, mill men, and the men of our transportation systems.

Let us turn for a moment to the Douglas fir region of Washington and Oregon. Here is an area approximately 100 miles wide and 450 miles long, containing forty per cent of the nation's softwood timber supply, an area which is producing annually one-third of the nation's lumber, and which today is providing the country with one-third of its lumber defense requirements.

To clarify what has come out of the West these past thirty years I shall strike six thumb-nail balance sheets which I hope will act as smoke-removers as far as the trees and the men of the Douglas fir region are concerned. Facts covering precisely the same period of time for the items in these balance sheets do not exist. Therefore, the figures presented cover varying periods, some just a decade, some longer. There are facts enough, however, to indicate direction, and that is what we are really interested in.

1. *Lumber worker's balance sheet* as of May, 1941, compared with 1929—Average hourly rate increased fifty-one per cent; weekly earnings increased twenty-six per cent; working hours reduced nearly seventeen per cent; cost of living declined twelve per cent; purchasing power or real wages increased thirty-eight per cent; group liability insurance increased eighty-nine per cent; disability benefits available to a worker and his family increased two hundred and eight per cent; and social security benefits added four per cent. Summarizing, the lumber worker in May of 1941 received forty-two per cent more in wages, security wages, and the things wages will buy, for working sixteen and two-thirds per cent less hours.

2. *Owners balance sheet*—For the twelve years, 1926 through 1937, according to federal income tax statistics, the Washington and Oregon sawmill and planing mill industry sustained an average annual loss of $2,909,000. For the nine years, 1931 through 1939, there was an average annual loss of slightly more than two per cent on the investment. For the five years, 1935 through 1939, which marked the upswing, an average annual return of two-tenths of one per cent on the investment is indicated.

3. *Tax balance sheet*—Today one-half of the tax revenues of Washington and Oregon originate from forests and forest products.

4. *Transportation balance sheet*—The forest industry furnishes sixty-six per cent of the total rail freight traffic and eighty per cent of the total water freight traffic originating in Washington and Oregon.

5. *Consumers balance sheet*—Lumber production in thirty years has been 200,000,000,000 board feet, sufficient to house one-third of the ppoulation of the United States. The 17,500,000 tons of pulp produced in thirty years would turn out 26,250,000,000 books, enough for 6,560 libraries the size of the one at Harvard University. Fifteen years of p'ywood production—7,000,000,000 square feet, or 250 square miles—is sufficient to cover three and one-half times the area of the District of Columbia. Thirty years of shingle production—200,000,000 squares, or 720 square miles—is enough to cover ten times the area of the District of Columbia.

6. *Forest balance sheet*—There are today 600,000,000,000 board feet of merchantable timber, trees over sixteen inches in diameter, standing on 14,000,000 acres in Washington and Oregon. From this gigantic tree farm we have cut 240,000,000,000 board feet in the past thirty years. Our average annual use and abuse of trees averages 9,000,000,000,000 board feet, drawn off by us, the people, from our western forests for lumber, pulp, plywood, shingles, fuel and by fires, insects and diseases.

There are more than 7,000,000 acres of junior forests in the Douglas fir region, trees less than sixteen inches in diameter, trees which are growing our future forest products and payrolls, often at the rate of from 500 to 1,000 board feet an acre each year.

As we cut the old growth timber we release the land for growing vigorous new crops. When our 26,000,000 acres of tree farm are all turned into new forests, the growth will at least equal the present drain of 9,000,000,000 feet a year. If we men of the forest industry continue to cut and protect these acres as we are at the present time, our tree farm should produce about 10,000,000,000 feet a year. If future markets for forest products can support a really fine, intensive forestry program, then the Douglas fir region can produce about 14,500,000,000 board feet of timber a year—almost double the present drain.

During the last thirty years, we, the people of Washington and Oregon, have actually planted 62,000,000 seedlings by hand on our forest lands—we, the men of the forest industries, of the federal Forest Service, of the state forestry departments, and we ranchers and farmers. For fifteen years a former chief of the United States Forest Service has been our leader in the lumber industry. Colonel W. B. Greeley is, we hope, encouraged by the fact that there are today more than 300 graduate foresters employed by the forest industry in Oregon and Washington. Forest-mindedness is growing among us.

This year the men of the Douglas fir region will harvest about 6,000,000 mature and over-ripe trees. These will be replaced by some 62,000,000 new young trees which will spring up naturally from the seed trees we leave, while the men of the industry will plant by hand from nurseries 1,800,000 to 3,500,000 seedlings, provided we can secure them. It is at present practically impossible for a private forest land owner to buy seedlings. At any rate, 1,800,000 young trees are now growing in our private nurseries and these will be set out. If we can "beg, borrow, buy, or steal" 1,700,000 more, they also will be planted.

The federal Forest Service will plant this year 2,500,000 seedlings, according to recent estimates. In other words, in 1941, we, the people of Oregon and Washington, with the aid of the Almighty, and with our own increased carefulness, will see to it that for every mature tree harvested, at least ten new trees will take its place.

But to talk enthusiastically about reforestation, sustained yield, tree farms, timber as a crop and selective logging is as useless as dust in a windy street unless we, the people, can keep fire away from all trees, young and old. Fire prevention is seventy-five per cent of successful forestry in the Douglas fir region. In practically all of the forest regions of Washington and Oregon vigorous young forests are growing on old cuttings and burns, very largely because natural re-seeding and protection from fire have taken place. There is, of course, room for improvement. Some spots have been burned and reburned four and five times due, to a large extent, to repeated human carelessness.

Ninety per cent of our forest fires are man-caused. Therefore, the vast majority (*Continuing on page* 350)

THREE LEGS ARE ENOUGH

By BEN EAST

IF YOU'VE ever watched a deer rocking off through the timber, clearing fallen logs as easily as you step over a doorsill, and picking a path through swamp thickets with never a misstep, you might have surmised that a three-legged deer would have a difficult time getting around.

This, however, is not the case, as George, Michigan's most famous whitetail buck, has proved. Probably he is the only deer in the world today leading a happy and prosperous life on three legs.

George was a late fawn, born in the summer of 1932 in the vicinity of the Ogemaw State Refuge at St. Helen, in north central Michigan. He still wore the spotted coat of his babyhood when the hunting season opened in mid-November and misfortune overtook him.

Walter Hastings, staff photographer of the Michigan Conservation Department, and Blaine Brannon, keeper of the refuge, were patrolling the refuge early in the season when they came upon the fawn, near death from hunger and cold and exhaustion, curled beside the dead body of his mother.

A careless or unscrupulous hunter, ignoring the buck law and the rules of decent sportsmanship, had blasted the doe with a charge of buckshot. The fawn lay beside her in the snow, waiting for starvation or prowling brush wolves to finish the job the violator had begun. His plight told a mute but powerful story of conservation and the men who don't believe in it.

Mr. Hastings photographed the tragic scene and produced one of the most appealing wildlife pictures ever made. This was published in newspapers from coast to

The buck's left hind foot never touched the ground

Hastings' original and now famous picture of the fawn with his dead mother

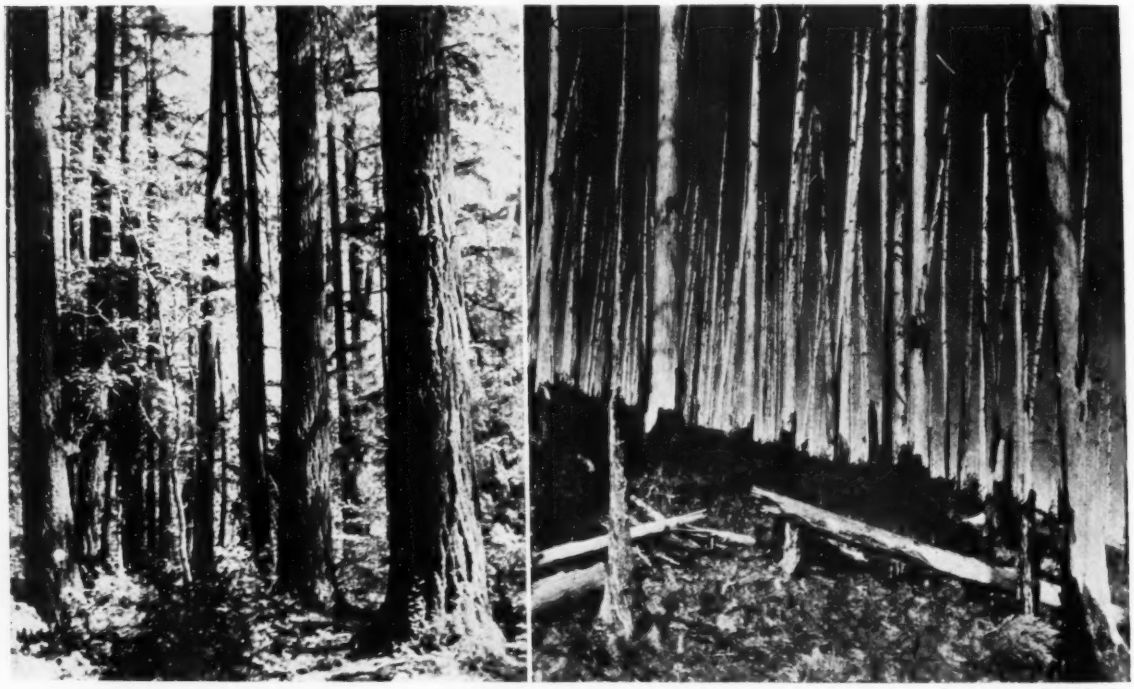
coast. Conservationists clamored for copies suitable for framing. Ten thousand prints were sold in two weeks in Michigan alone, and a nationwide chain of dime stores got permission to place it on the market. George had become overnight the most famous deer in the world, a living and pitiable symbol of broken game laws.

Meanwhile, the fawn himself was getting along well in a cozy stall at the refuge headquarters. Under the care of Mrs. Brannon, who had had plenty of experience in bringing up orphan fawns, he recovered rapidly. Within a week or two there was only one thing wrong with him. A pellet of the charge of buckshot that had killed his mother was imbedded in the joint of his left hind leg, depriving him of its use.

The following spring George was given his freedom on the refuge where he has roamed at will ever since, save for a short period in November each year. When it is time for the hunting season to open he is enticed into a three-acre fenced enclosure at the headquarters and kept there until the hunting army leaves the woods. Refuge or no, Michigan conservation officials are taking no chances on George having any further bad luck with hunters. He is now so tame that shooting him would be as easy as shooting a cow in a farmyard.

Every afternoon George comes to the refuge headquarters for his daily feed of grain, heading a herd of from twenty to fifty semi-tame deer. Visitors to the refuge delight in this scene.

George has adjusted himself to the loss of his withered leg astonishingly well. He stands with his good leg turned in at an odd angle, so that the foot supports his weight under the center of his hind quarters. His walk is clumsy and slow, painfully achieved with short laborious hops, but when he takes off in high gear he is far from a cripple. The heavy-muscled leg propels him along at a good clip, in the long swinging bounds of a normal whitetail.



Forest Service

A FOREST—BEFORE, AND AFTER—FIRE

BY ETHEL ROMIG FULLER

I

How like a church, cool, dim and still,
A forest stretching, hill to hill—
No living man as old as these
Conifers, with centuries
Ringed within their bark, and all
Straight as spars, and heaven-tall.

At their bases, ferns grow lush;
In their crowns, thrush calls to thrush.
Fragrant flowers spice the air;
Brooks sing carols; soft eyes stare
From a thicket, where a fawn
Is glimpsed, then like a dream, is gone.

II

How like some inferno, dire
With foreboding, after fire
Rampages up and down the aisles,
Laying beauty waste for miles;
Leaving beauty without seed
Against a future time of need.

Mute, the songs in throats of brooks;
Smouldering ashes fill the nooks
Loved by ferns. The fawn lies dead;
No thrush calls from overhead;
And slowly all the now charred hosts,
Which once were green trees, turn to ghosts.

AN ALIEN IN BRAZIL

By

EDMUNDO NAVARRO DE ANDRADE

Thirty-eight years ago a ship put out from the shores of Portugal bound for Brazil. Among its passengers it carried a young Brazilian, Edmundo Navarro de Andrade, who a few weeks before had been graduated from the College of Agriculture of Coimbra. Now at last the young man was returning to his native land with eager enthusiasm to apply the knowledge he had spent years to acquire.

At Coimbra one of his courses had been in forestry. Perhaps that explains why he carried in his trunk a packet of seeds of the eucalyptus tree which he had collected in Portugal. The species did not occur naturally in Brazil and young Navarro had been intrigued by its rapid growth. Beyond that his motives in collecting the seeds were not clearly formulated. Little did he dream that the packet tucked away in his trunk was a talisman destined to bring him fame in years to come.

Last month Edmundo Navarro de Andrade—or Dr. Navarro as he is better known—came to Washington, D. C., to receive the Meyer medal for distinguished services in plant introduction, awarded by the American Genetic Association. The award was made in recognition of his remarkable work in developing and getting accepted the alien eucalyptus as the most important tree in the State of Sao Paulo, Brazil. After years of patient research and experimentation during which he had to fight bitter local opposition to the introduction of an exotic tree, Dr. Navarro today can point to over 100,000,000 eucalyptus trees growing in the State of Sao Paulo and as many more in surrounding states. By world travels, he has studied the eucalyptus in every country of the world in which it grows, and from his forestation experiments in Brazil with more than 150 species of the tree, he has found a number of species that yield commercial cuttings every seven or eight years.

Forester for the Paulista Railroad Company of Sao Paulo since 1903, Dr. Navarro has made eucalyptus the principal reforestation tree of his country and a major source of fuel for the operation of Brazilian railroads. The story of his work as told by him on the occasion of his acceptance of the Meyer medal in Washington on June 2 is given below.—EDITOR.

"DR. NAVARRO, why was it that you selected the eucalyptus for the work of reforestation by the Paulista company and not some other tree? Why did you give preference to an exotic tree, when, in the Brazilian flora, there are famous timbers so numerous?" I have been asked these two questions for so many years by so many hundreds of people that I wish to give a definite reply.

Upon returning to my country from Europe, at the end of 1903, a graduate of the College of Agriculture of Coimbra, Portugal, I was invited by the Paulista Railroad Company to organize and direct the first forest plantation that it intended to create along its railway lines. The Paulista company foresaw with notable vision that in the not very remote future there would be a shortage of firewood, posts, ties and timber.

When taking charge, my first care was to secure the greatest possible number of arboreal species indigenous and exotic for the purpose of trying them with all possible scientific rigor. For five years alone and without publicity I applied myself to this task, performing a

The author's home in Rio Claro, surrounded by a forest of eucalyptus planted under his direction since 1913. The plantation embraces 6,000 acres and contains 110 different species of eucalyptus, the seed of which came from Australia

Here is the beginning of a practical test with one of over 150 species tried. The small trees bordering this Brazilian road are one year old

The same trees when two years old. Their parents growing in Australia would be proud to see how they are taking to Brazilian soil

And here they are after four years. The species is Eucalyptus tereticornis—one of the best for growth in Brazil which Dr. Navarro has found

considerable series of experiments, establishing nurseries and a great number of experimental cultures. Among the trees that were tried were some species of eucalyptus, which I had brought from Portugal, and others from seeds that I had collected from trees planted in Sao Paulo, which were used chiefly as shelters, windbreaks or ornamental trees.

For a long time I had been impressed by the extremely slow development of nearly all the Brazilian trees, especially those most famous for their timber. There was a deep-rooted idea in my country that the slower the growth of a tree the better its lumber; an idea, like so many others, completely disproved by the eucalyptus.

If my work had dealt with simple reforestation to cover poor or uncultivated soil, or with the creation of protective growths, or even of government work of unlimited duration the slow development of Brazilian trees would not have been an obstacle to embarrass it. Instead, it dealt with a private business, an industrial enterprise and the creation of forests capable of furnishing definite and determined products in periods not long, but of economical duration. It would not be possible nor reasonable for a railroad that was going to need fuel wood, stakes, poles, posts and ties in a few years to plant trees whose utilization could only be realized upon their reaching a century of age.

Six years of patient study and hard work were necessary to reach plausible conclusions, always with the fear of making precipitate resolutions in a field of silviculture, in which time is measured by decades and in which the life of trees is counted in centuries. It was this that led me to propose to the Paulista company that they enlarge our field of action and experiment, making the culture of experimental plots on a large scale and starting plantations of some species that seemed favorable to me. To this end there was acquired in 1909 a large agricultural tract in Rio Claro. This contained more than 6,000 acres and became the seat of my work. My studies there were the origin of and stimulation to the planting of tens of millions

of eucalyptus growing today in my state and in nearly all of Brazil. In Sao Paulo alone there must actually be about 100,000,000 of these precious trees, and almost as many more disseminated throughout the rest of the country. At the time when I went to Rio Claro I could already depend upon seventy-two species of eucalyptus, eighty-three of Brazilian woods and a large number of American, European and Australian trees.

Knowing of the development that the culture of eucalyptus was having in the United States, principally in California, I came here in 1910 to gain knowledge and with the hope of obtaining new species. Unfortunately I learned little about eucalyptus, but rather gained the impression that there was more thought of a purely commercial enterprise than of a scientific undertaking. It seemed to me that it was more a proposition of selling lands planted with eucalyptus than a study of the problem of culture and use on a scientific foundation.

Three years later, in 1913, I was sent to Australia, almost exclusively the native home of the genus eucalyptus, and where the greatest authority on the subject was living. He was Professor J. H. Maiden, director of the Botanical Garden in Sydney, and the author of *Forest Flora of New South Wales* and of the monumental *Critical Revision of the Genus Eucalyptus*. I had the rare good fortune of working privately with Professor Maiden and of clarifying, with him, obscure points in the problem that interested me so much. Besides a most valuable herbarium, the noted scientist gave me a collection of seeds of 130 species of eucalyptus probably most adaptable to Brazil, some of them entirely unknown in my country. Of these I retain today 110. My collection has been increased by others obtained in Algeria, especially the hybrids obtained from Dr. Luiz Trabut, and by some obtained in South Africa, until there are 123 species of this extremely rich genus actually represented in the cultivations of the Paulista company.

From 1918 to 1926, on nu-

Crops from eucalyptus forests planted by Dr. Navarro. These logs were cut from trees fifteen years old

Some of the many millions of eucalyptus fence posts the author has grown for the Paulista Railroad

Through Dr. Navarro's remarkable work eucalyptus is now the main fuel of the railroads of Brazil

Here Dr. Navarro, wizard of the eucalypts, shows a remarkable growth in Rio Claro—E. Saligna, only four years old

merous voyages, I traveled over the whole world, visiting all of the countries in which eucalyptus is cultivated, even on a small scale. I carried seeds from all these countries to Sao Paulo and made interesting experiments upon the development and adaptation of the different species according to the origin and source of the seeds. Thus, for example, I could demonstrate that one of the species, *Eucalyptus Gonicalyx*, always developed poorly when obtained from seeds native to Australia, but on the contrary, always gave magnificent results when the seeds were brought from California.

Not all species gave satisfactory results. Of the 130 that I received from Professor Maiden, twenty-five are of the best and fifty others are good. The others were of little cultural value. An interesting fact that I have observed is that species originating in Western Australia have been, without exception, failures in Brazil, a country situated on the eastern coast of America. These same species have given good results in Chile, Mexico, California and Cape Colony—all regions of western situation on their respective continents.

A phenomenon difficult of interpretation occurred shortly after the Paulista company selected the eucalyptus as a tree adequate for its purposes. There was initiated against these trees the strongest and most vigorous campaign of which there is memory in the field of agriculture in Brazil. Any initiative, even the most daring, is habitually received with applause, or at least expectant sympathy in new countries, until they have been proved devoid of good sense. With eucalyptus it was quite the contrary. It was received with fire and sword, like an undesirable foreigner in whom all the defects were recognized and in whom all virtues were denied. This would have been comical if the best years of my life had not been spent in this campaign in a country whose principal wealth lies in the culture of coffee, an exotic plant; a country which did not know how to defend the wealth it possessed in rubber, the most native of national trees.

At the end of the past century eucalyptus awakened enormous enthusiasm in the various countries whose climate seemed favorable to its cultivation. France, Italy, Spain, Algeria and Egypt carried on much propaganda in favor of this Australian tree. California, the Hawaiian Islands, South Africa, Argentina and Uruguay also started large plantations. (*Continuing on page* 336)

Seventeen years produced this tree thirty-six inches in diameter at breast height. It was planted by the author and is growing in his home grounds in Rio Claro

RADIO ON THE FIRE-LINE

Forest Protectors Shorten Lines of Communication in Unceasing Battle With Fire

By A. G. SIMSON

MOST forest protectionists possess a mental agility which impels them to try almost any device that appears to be useful in the business of fire prevention and suppression. Portable pumps of various sorts, psychologists, giant flyswatters, parachute jumping smokechasers, mechanical fireline builders, artificial wind machines, aerial freighting and radio all have been put on trial by hopeful, though critical, experts.

Several of these innovations have come into intensive use within the last few years, and among these radio is outstanding. There are good reasons for this. First, radio can furnish communication where no other means are available or even possible. Second, radio enables the forest protection executive to get better utilization of his forces, hence more protection for every fire prevention dollar. Moreover, in many instances radio is actually cheaper than wire lines of communication.

Radio in forestry is used mainly during fire emergencies, though fire is not the only emergency the forester has to meet with it. For example, radio has been used for long-distance diagnosing and prescribing for appendicitis and other ailments. A California ranger received a funeral service by radio which he was asked to read at the burial of two victims of a back-country hiking accident. Radio has played an important part in locating airplane crashes, in searching for lost persons, and in rescue work during floods. To meet a sudden emergency up in Alaska a local resident was sworn in as deputy marshal via the Forest Service radio.

The backbone of forest fire detection is the fire lookout system. Basically, it consists of trained observers stationed at observation towers or in lookout houses situated on prominent mountain peaks. Some means of communication, principally telephone, is provided so the lookouts can report the location of new fires to the central fire dispatcher or to the fire suppression crews.

The system works well but it is inherently inefficient. This is because the fire hazard changes from day to day with variations in weather and the number and type of forest visitors, and also because the effectiveness of the lookouts varies as visibility is modified by smoke, haze, or low clouds.

Obviously, the desirable situation is one where the number of lookouts and their location can be changed according to the dictates of fire hazard and visibility. That is, on days of low hazard and good visibility the number of lookouts may be reduced to a minimum and, conversely, on bad days or when poor visibility reduces the effectiveness of the lookouts they can be augmented by a force of emergency lookouts and patrols.

Portable radio makes full development of such an arrangement possible because it enables the lookout to carry his means of communication with him wherever he goes. It isn't necessary now to build and maintain a telephone line to a potential lookout point in order to have it available for emergency use. Lookouts and patrolmen equipped with portable radio are no longer limited to locations where telephones are available.

Radio also permits more effective use of fire fighting forces. Organized suppression crews can be used on such work as timber stand improvement, road construction and hazard removal when not actually fighting fire, if they are equipped with portable or mobile radio so that they are constantly on call.

The backbone of fire detection is the lookout system and, in many lookouts, radio is the only means of communication

A base camp radio station. Here, as in a military operation, direct communication with the various units of control and activity coordinates the work on the fire line

Direct communication with the fire line enables the fire dispatcher to make more economical use of his forces. Without communication he may be in doubt as to when reinforcements are needed and, to play safe, send men when they are not actually required. On the other hand, unless he knows definitely what is happening on the line, he might not send urgently needed reinforcements at all.

Where fire trucks are used intensively, as in California, constant radio communication means that they are always "in service," even when making a run. It has enabled the dispatcher to recall trucks from false alarms; also it has enabled him to re-dispatch fire trucks without the necessity to return to headquarters for orders. In the handling of large fires, radio is invaluable. Its usefulness is roughly in proportion to the size of the fire, other factors being equal.

Fire organization and fire fighting methods vary greatly in different parts of the country. In timber types where fires are relatively short-lived and not too difficult to control, the organization is simple and usually the crews are small and few in number. On the other hand, in the heavily forested regions of the Pacific Northwest controlling a conflagration fire is especially difficult and calls for the last word in high-powered methods.

Combating a conflagration fire in such a country presents an organization and administration problem comparable to a military operation. Thousands of men must be transported, bedded, fed and given first aid as required. An immense amount of machinery, automobiles, trucks, tractors, trailbuilders and special equipment must be kept in operation. And, as in military operations, adequate and well organized transportation and communication facilities are vital.

Perhaps this may be more clearly presented by visualizing the communication organization on an hypothetical conflagration fire. Suppose that an unfortunate combination of weather, topography and fuels has developed a fire of about 50,000 acres. The perimeter of the fire will be about seventy-five or a hundred miles. Several thousand fire-fighters will be employed, split up in camps of about 200 men each, spaced appropriately along the fire line. The fire will be in charge of a fire chief. Directly under him will be an assistant chief, chief of service of supply, transportation chief, equipment chief, head scout, communication chief, paymaster and sector bosses. Each sector boss is directly responsible to the fire chief for his sector of the fire. If such a widespread operation is to function effectively, it must be fully coordinated and such coordination is only possible where there is instantaneous communication with all units. Here is where radio is most effective. The communication circuits employed are basically in two categories—the base camp net and the several sector nets.

The base camp must have communication with the regional fire equipment depot. Traffic on this circuit has to do with the dispatching of labor forces to and from the fire; with ordering and routing food, tools, machinery and repair parts. Communication between the base camp

Radio extends the limit of operation of field fire fighting forces. Here a scout is using a type "S" portable radio to call base camp and make his report

and the administrative headquarters of the forest unit on which the fire occurs, generally has to do with coordination of the normal forest activities with operations on the fire, and with utilization of all available facilities of the forest unit.

Communication with the mobile fireweather forecast unit, which is manned by United States Weather Bureau officials, comprises transmission of weather data and receipt of special fire weather forecasts. Base camp communication with reconnaissance and freighting airplanes is required for dispatching, for safety in flight, and to receive reports on fire location and behavior.

Communication with the sector camps mostly relates to movements of labor and supplies, reports from the sector boss on fire behavior and work progress, instructions from the fire chief on "battle tactics," disposition and movement of fire-fighting forces.

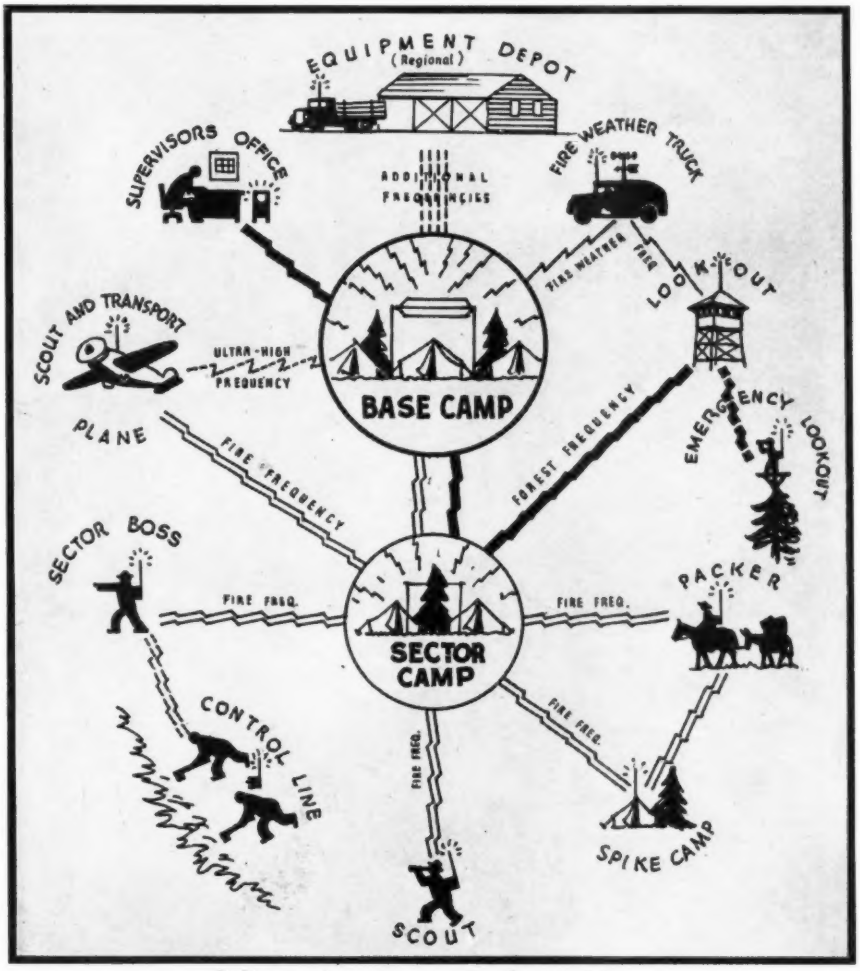
In addition to communication with the base camp, the sector camps centralize communication within their own sector. The traffic consists of contact with key points on the fire line, servicing subcamps, contact with scouts on the fire, direct communication with regular and emergency lookouts serving the sector.

Supplementing sector camp communication is the short-range communication between crews working directly on the fire line. The principal value of this service is in permitting the quick shift of men for relatively short distances along the line as reinforcements where "flare-ups" or "spill-overs" occur. Much of the radio apparatus used by fire-fighters is designed to meet the special requirements of the job. Experience with the more conventional types of commercial radiophones showed they were not suitable for many forest protection communication uses. Either they were too heavy, too bulky, consumed too much power, or were too complicated for use by untrained men.

More than ten years ago the federal Forest Service concluded it must "roll its own" if it was to employ radio to a practical extent. Therefore, the Service set up its own radio development laboratory. It is truly a development rather than a research laboratory for the Forest Service has not engaged in fundamental radio research, nor does it seem likely to do so. The function of this establishment is to design radio apparatus, modified by exhaustive service tests under actual field operating conditions, best suited to meet the peculiar and rigid requirements of forest protection communication.

About nine different types of two-way voice radiophones have been developed and are currently in use—each designed for a specific purpose. Low power is used throughout; the maximum is twenty-five watts, the lowest powered radiophone has about one-tenth watt output.

Use of Forest Service designed radiophones is not limited to the Service. They are used by other forest protection agencies to a greater or less extent. Among these are the British Columbia Forest Service, the Australian Forest Service, state forestry organizations, federal government agencies such as the Indian Service, National Park Service, Reclamation Service, and non-forestry agencies such as the Lighthouse Service and the Navy.



Radio network as set up on a "conflagration" fire

Existing radiophone models are constantly being improved to keep step with technical advances; new radio uses and operating technique are constantly being explored. Some of the current development projects are: automatic relay stations to extend the communication range of the ultra-high frequencies beyond the line-of-sight, radio facsimile transmission of fire maps and messages, portable radio direction finders to orient and otherwise aid smokechasers in locating "sleeper" fires where it is difficult to follow a compass course.

THIS IS FORESTRY

By G. H. LENTZ

AT Johnsonburg, Pennsylvania, Edward Ehrhart, forester for the Armstrong Forest Company, is applying forestry to his pulpwood operations in second growth hardwood forests. The pulpwood he cuts is converted into paper for use by the publishers of the nation's most widely read five-cent weekly, the *Saturday Evening Post*. Mr. Ehrhart's wood cutters are trained to cut in a selective manner the beech, birch, maple, and even black cherry used by the company in making its pulp and paper. When asked if it isn't a shame to use good black cherry for pulp and paper, Mr. Ehrhart answered, "The boss says no wood is too good to produce paper for the *Post*."

Cutters buck cherry pulpwood into fifty-two-inch lengths on one of the experimental plots operated under selective cutting on the lands of the Armstrong Forest Company, where an interesting study in production was made

The Armstrong Forest Company owns and manages some 50,000 acres of mixed hardwoods in Elk and McKean Counties, within easy trucking distance of the pulp and paper mill at Johnsonburg. The hardwood stands are typical of those found in the Alleghenies. The virgin timber from this portion of Penn's Woods found its way to some of the numerous sawmills which from 1860 to 1900 placed Pennsylvania among the first five States in amount of lumber produced. Now only a remnant of the virgin forest remains and the greater portion of the land is covered with second growth timber from twenty to sixty years old. It is this second growth that is being cut today by a selective system to supply pulpwood now and in future years. Along with the pulpwood, Mr. Ehrhart is also directing his operations so as to provide in the future a certain amount of high grade sawtimber. For example, the black cherry is being favored where possible in the expectation that cherry, once a favorite wood for cabinet and furniture making, may again be in demand.

This mixed stand of cherry and maple, forty-five years old, indicates the fine second-growth hardwood on the property, where practical forestry has been applied to the pulpwood operation which produces the paper for the "Saturday Evening Post"

The story behind this forestry and pulpwood operation is an interesting one and illustrates what can be done by a cooperative approach by labor and

management. As a result of careful planning, combined with consideration of the welfare of the woods workers, a procedure has been worked out which results in good forest practices and excellent labor relations. This can be illustrated best by describing briefly the manner in which the woods operations are organized.

All of the wood cut for the pulp mill has to be peeled, cut into fifty-two-inch lengths, piled for seasoning, and then hauled to Johnsonburg. The relatively short period when the bark "slips" determines the peeling season. When cutting operations started some five years ago it was common practice for the cutting, peeling, bucking, piling, and hauling to be carried on simultaneously. This meant that the working period was restricted to the months of May, June, July, and August, when peeling was possible. Now the crews concentrate on felling and peeling during these months. Then when the bark tightens in August, the same workers go back over the cuttings, buck the peeled stems into pulpwood length, rank the bolts in ricks close to the woods roads, and start the hauling. Instead of four months, the job is thus stretched out to seven or eight months. Road building and other improvement work transforms what formerly was a short, seasonal woods operation to almost year-round employment.

This long period of employment has many advantages, the most important being the maintenance of a small regular work force with little turn-over from year to year. With steady employment the workers take greater interest in their work and this is one of the secrets of Mr. Ehrhart's success in his forestry work. He has been able to train his force to apply selective cutting methods with a minimum amount of supervision by him or his assistant, Paul Shull.

Where the eleven-inch diameter limit was applied, a good stand of mixed hardwoods was left for another cut to be made within twenty years' time

As opposed to selective handling, this area in McKean County was clear cut for chemical wood and it will probably be forty to fifty years before another cut is possible

Devastation, resulting from clean cutting followed by fire, in nearby Elk County. The area would have to be replanted if it is hoped to bring it back into production within two or more generations

At the start of this selective cutting, the foresters laid out an eight-acre demonstration area on which the trees to be cut were carefully selected and marked. The cutting crews, under close supervision, cut this area, giving full consideration to low stumps and to not injuring the unmarked trees. The reasons for selecting certain trees and reserving others were explained as was the general idea of growing pulpwood as a crop. After the lesson was learned, the cutters were told to follow this principle in all of their cuttings. They soon grasped the idea that the system would insure future crops and future jobs.

An interesting reaction was aptly expressed by one of the cutters—"It makes it possible for us always to work in the shade." Only about forty per cent of the number of trees on an acre are removed in one cutting. In twenty years' time another partial cut can be made and there is always a growing crop on the ground. In general, no trees measuring less than eight inches in diameter at breast height (four and one-half feet above the ground) are cut unless they are crooked, diseased, or otherwise undesirable.

These are the technical foresters who headed up the interesting pulpwood study on the lands of the Armstrong Forest Company. Left to right — Carl E. Ostrom, G. H. Lentz, W. S. Swingler, George P. Kramer, W. G. Edwards and E. O. Ehrhart, forester for the Company

The company officials were satisfied that the forester's policy of partial cutting was good forestry and was economically sound. This policy, however, was so frequently questioned by other operators that it was decided to ascertain the actual difference in cost between several methods of cutting. Was it really cheaper to cut only those trees larger than eight inches in diameter at breast height? In order to get the answer, a study was inaugurated in cooperation with the U. S. Forest Service. All of the operations in this study were carried on by regular wood cutters on the company's payroll. They were supervised by George Kramer from the Forest Service Division of State and Private Forestry. He laid out the cutting plots and kept the time and production records. These records in turn were analyzed by Carl Ostrom of the Allegheny Forest Experiment Station.

On an area of forty acres on the company's Wolf Run tract, three series of six plots each were laid out—a total of eighteen plots. On the first series all trees down to five inches in diameter were cut. The limit on the second series was eight inches, and on the third series the diameter limit was eleven inches. Accurate records were kept for each operation on each plot, and these were then grouped by the diameter limits and analyzed.

It was found that on a cost basis there was only a slight difference between the plots cut to the eight-inch and eleven-inch diameters. But there was a real difference when the diameter limit was dropped to five inches. To cut, limb, peel, buck, and pile a cord of wood in the five-inch limit plots took 11.55 hours. To produce a cord from trees eight inches and up took only 9.59 hours. With labor at thirty cents an hour, the comparative costs are: Five inches and up—11.55 x $0.30 or $3.46 a cord. Eight inches and up—9.59 x $0.30 or $2.88 a cord. Thus it costs $0.58 more a cord to cut to a five-inch limit.

The cut from the five-inch limit plots yielded 20.95 cords an acre, and from the eight-inch limit 16.62 cords. With an assumed value of $5.00 a cord, the comparative costs and returns an acre are: For five-inch limit—cords an acre, 20.95; cost 20.95 x $3.46—$72.48; value 20.95 x $5.00—$104.75; profit an acre—$32.27. For eight-inch limit — cords an acre, 16.62; cost 16.62 x $2.88—$47.86; value 16.62 x $5.00—$83.10; profit an acre —$35.24. Thus the eight-inch cutting would actually net $2.97 an acre more than when all trees down to five inches in diameter are cut. This sounds almost like a Ripley "Believe it or not."

The data also showed that in order to produce a cord of peeled wood from trees from five inches to eight inches, twenty-three trees were required. When trees eight inches to eleven inches were cut, only 9.2 trees were needed to make a cord, and when eleven inches was the lower limit only—4.3 trees.

It is also interesting to note—especially for purchasers of pulpwood—that the solid contents, or paper making tissue, of a cord increases with the diameter of the trees from which the wood is cut. Thus in a cord of wood cut from trees measuring five inches to seven and nine-tenths inches there were only eighty-nine cubic feet of solid material as compared to one hundred and four and six-tenths cubic feet of solid wood in a cord produced from trees eleven inches and larger. This is another argument for selective cutting, or at least cutting to a fairly high diameter limit even for pulpwood.

Mr. Ehrhart's cutting policy has thus proved to be sound financially as well as silviculturally. When the costs of roads and overhead are prorated, the advantage is still in favor of his selective cutting. By leaving trees smaller than eight inches the acreage returns are greater and the cutting cycles (periods between cuts) are shorter. This is practical forestry. It shows what can be done on a sound, common-sense basis.

EDITORIAL

THE CCC AND DEFENSE

THE LATE Robert Fechner before his death two years ago was wont to say that the CCC had advanced conservation in this country by thirty years. In point of constructive work done, Mr. Fechner was probably conservative. Certainly the public both before and since his death has concurred in the high valuation which he placed upon the Corps.

What Mr. Fechner could not appraise, however, was the value of the Corps, past and present, in advancing national preparedness. Such an appraisal ought to be made, not as a matter of history but as a working blueprint for determining the most effective use of the Corps now in meeting specific national defense needs. Here is an established governmental agency fully organized and reaching into every section of the country which has rehabilitated upwards of three million youths, put strength and health into their bodies, taught them to live and work together, trained them through practical work experience as truck and tractor operators, telephone linemen, fire fighters, bridge builders, powder men, radio operators, cooks and in scores of other trades. Its field of training service has been mainly with boys below draft age. It is experienced and equipped to continue that training. And of special importance is the fact that its type of work training contributes in a large way to guarding and developing natural resources vital to the success of the whole national defense effort.

Considering these things one would expect that with the development of the emergency, immediate steps would have been taken to integrate the Corps organization into the national defense program. Quite the contrary appears to be the case. Its organization, experience and potential services, developed at great public expense, seem to have been largely ignored and passed over by the national defense heads and planners with the result that its future is in grave jeopardy. Due to lack of specific defense status, to increasing opportunities for employment and to the competition of other federal agencies, the Corps' field of service is being limited and disrupted by shrinking enrollment.

Now comes a proposal that the Corps be merged with the National Youth Administration. In a public statement issued last month, the American Youth Commission called for immediate consolidation of these two agencies with the major objective of preparing young people still in need of assistance and those disqualified for military training to render most effective service in the present emergency. As now operating, the Commission implies, neither CCC nor NYA are able most effectively to meet the needs of the present period of emergency or of the period of readjustment to follow. This failure the Commission attributes to confused organization, overlapping of objectives and competition for enrollees, administrative personnel and appropriations.

The American Youth Commission is a non-governmental agency created six years ago by the American Council on Education to study the problems of youth. Its findings, therefore, are presumably based upon extended investigations of the CCC and NYA and their operations under changed conditions brought about by the defense emergency. In pointing out a situation that has become more and more aggravated since the emergency began, the Commission has rendered a distinct public service. It is to be regretted, however, that out of its years of study, its recommendations fail to suggest a specific and clear-cut program of consolidation or of activities that will meet essential needs in the present emergency. Consolidation does not answer that question. The answer really lies in a clarification of the work which these two agencies singly or in combination are best qualified to perform in furthering the defense program.

Such a clarification has not been forthcoming. Lacking any clear chart of emergency services implemented with the preparedness program, they have been pretty much left to themselves to find where and how they can best serve during the present emergency, with competition for enrollees and work projects becoming increasingly intense.

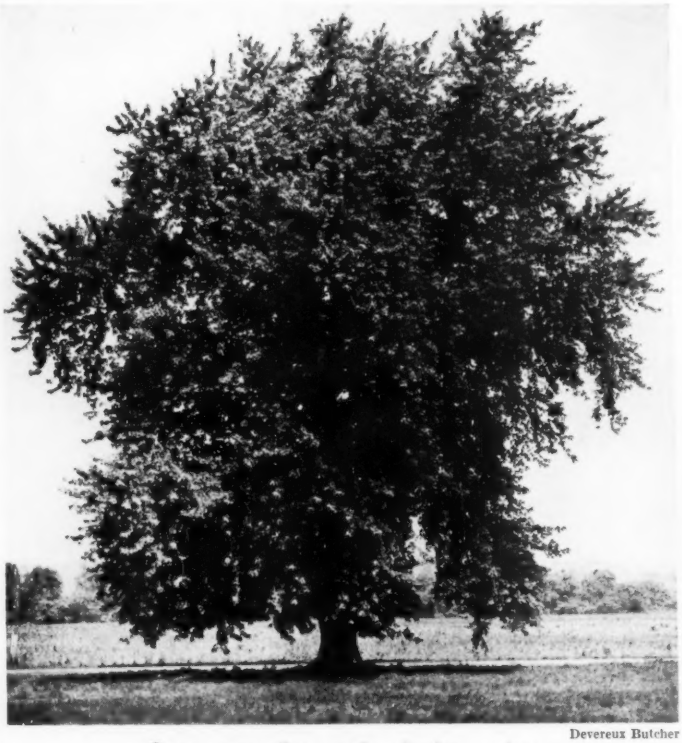
The root of the trouble, we believe, is to be found not in the agencies themselves but in the Federal Security Administration where heads the responsibility for clarifying and coordinating the types of essential emergency work needing to be done in the field in which the two agencies operate. Had the Administrator when the emergency began to deepen worked out with the War Department and other defense agencies a chart of implemented services and applied to it the necessary administrative control and coordination, the present situation need not now exist.

Instead a *laissez-faire* policy of administration appears to have prevailed with the result that unless decisive or clarifying action is soon taken, there is danger of one agency swallowing the other. Whether the swallowing process will be in the best public interest or will contribute most directly and most helpfully to meeting the emergency is a grave question. It is particularly grave from the standpoint of the CCC which, we think, offers an established framework for rapid training of boys below draft age to fill useful places in the emergency that would take months and millions to set up as new governmental machinery. Furthermore, to liquidate the CCC or to divert it from its basic and sound principle of training through performance of protective conservation work would be somewhat like removing guards from factories and warehouses filled with national defense equipment.

SILVER MAPLE

Acer saccharinum, Linnaeus

By G. H. COLLINGWOOD



Devereux Butcher

Open grown silver maples develop a short trunk that divides into several large ascending limbs with long pendulous branches

Bark on trunk and larger limbs of mature trees is thin, gray, and broken into broad, flaky scales

SILVER maple, sometimes called soft maple, is one of sixty or seventy species of the *Acer* family distributed widely over the northern hemisphere, with one species south of the equator in the mountains of Java.

It is found as far north as New Brunswick and westward across southern Quebec, Ontario, Michigan, to southeastern South Dakota and Kansas. Although seldom found on the Atlantic coast or on the high Appalachian mountains, its range extends south to western Florida and Oklahoma. It never forms pure stands, but grows scattered through the forest in the moist soil of bottomlands, or along the borders of swamps and sluggish streams. It endures moderate shade, tolerating more shade in wet sites than in dry ones. Silver maple seldom lives over one hundred and twenty-five years, growing most rapidly during its first half century.

In the open, silver maple develops a short trunk measuring two to four feet in diameter, and dividing into several large ascending limbs that terminate in long pendulous branches to form a broad, rounded crown. Forest grown trees have trunks that rise clear of limbs for thirty to fifty feet before the branches form a medium broad crown sixty to eighty feet high. In the Ohio basin silver maple is more abundant than elsewhere in its range, where it sometimes grows to a height of one hundred and twenty feet.

During the first mild days of late winter or early spring when the leaf buds have scarcely begun to swell, the yellowish green stemless staminate flowers and the long-stemmed pistillate

Devereux Butcher

U. S. Forest Service

Pistillate flowers are yellowish green, and appear in late winter or early spring

Devereux Butcher

Leaves are green above, and silvery beneath, while the seeds which ripen in spring occur in pairs or keys

flowers open. Growing in thick clusters on the twigs of the preceding year, the staminate and pistillate flowers appear on the same or different trees. Later leaves appear borne on slender drooping stems. They are pale green and shiny above, smooth and silvery beneath, and measure four to six inches long and nearly as broad. They are five-lobed, deeply indented, sharply toothed with an even or heart-shaped base. The seeds occur in pairs or keys, suspended in clusters on slender, drooping stalks and have thin divergent wings one to two inches long. Some seed is produced every year, but abundant crops occur at irregular intervals. When they fall on moist soil germination follows shortly, and before the end of the summer have produced plants with several pairs of leaves. Silver maple sprouts readily from the stump, but trees begin to lose the ability to sprout or coppice after the trunk diameter exceeds a foot.

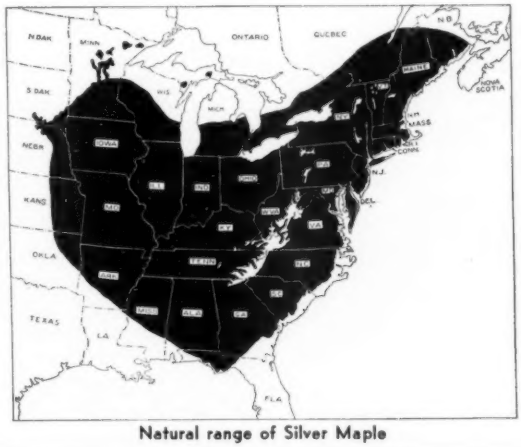
The thin gray bark on trunk and larger limbs of old trees is broken into broad scales which flake off readily, while on younger trees and on branches of mature ones it is smooth, gray, or slightly tinged with brown. Twigs are green or reddish, and when broken, give out a rank odor. Leaf-buds at the ends of the twigs are encased with three or four pairs of red scales and measure about one quarter inch in length. Buds along the sides of the twigs are borne on short talks and are usually accompanied by the lustrous flower-buds.

The light brown wood weighs thirty-four pounds to the cubic foot when air dry, is strong, brittle, close-grained and rather hard. The sapwood is pale to almost white and with the heartwood takes a good polish and is used for cheap furniture, flooring, interior finish, woodenware, veneer and fuel. Considerable quantities are burned for charcoal, wood acetate and other products of distillation. Silver maple is sometimes mixed with the wood of other maples but is not as strong, hard or heavy. It is estimated that silver maple forms about five per cent of the total maple cut in the United States.

It is widely planted as an ornamental tree along roadsides and around homes, where its principal attribute is the comparative rapidity with which it grows.

U. S. Forest Service

Staminate flowers occur on the same or different trees from the pistillate, and are yellowish green



Natural range of Silver Maple

An Alien in Brazil

(*Continued from page* 326)

However, the enthusiasm cooled and only the Union of South Africa and two or three other countries continue the cultivation with the original enthusiasm. Why? I am firmly convinced that in the great majority of these countries there was lack of a scientific foundation, of technical character of the work, and chiefly a lack of tenacity and continuity in the studies. I attribute the enormous result obtained by the Paulista company to the fact that I lived, undismayed, as the personal head of the work for thirty-eight years, without a single break in the continuity of the work. The great merit of this undertaking lies in the fact of having studied eucalyptus exhaustively from the cultural phase to its utilization, and what is more, in all its possible applications. Our experiments were performed in a great variety of climates and soils and were always made on a considerable scale.

The eucalyptus was submitted by me to all possible and imaginable tests, always under the eyes of the native critics. I always worked under the full fire of the enemy's batteries. Everything I used to do or to try was a reason for censorship always coming from those least familiar with the matter.

An example will show better the atmosphere in which I worked. Everyone was against me because I decided to adopt eight feet as maximum distance between the trees, finding, however, that the distance of six and a half feet was preferable. Everyone thought that the eucalyptus owing to the rapidity of its growth and in order to develop its crown should never be planted at less than sixteen feet; some even advocated a distance of thirty-three feet! Facing the general clamor, the Paulista company itself became alarmed that I was wrong. There was only one practical means of convincing them and this was the one which I used. I began experimental and comparative cultivations of the same species, on the same soil, with the same cultural treatment and also on the same day, keeping a distance of six, eleven, thirteen, sixteen and twenty feet between the trees. After seven years, I made the first cutting for fuel; five years afterwards, a new cutting; and after another seven years the third cutting, which resulted in a patient expectation of almost twenty years.

Result: At twenty feet we got, in the three cuttings, twenty-two cords an acre or a little more than seven cords an acre in each cutting; at six feet we obtained 120 cords an acre or forty cords an acre in each cutting, or practically six times more than with the first spacing. In this way, I had to go, step by step, slowly overcoming resistances, bad faith and ignorance.

I must confess, and I make it with the greatest pride, that I was victorious because I had as a support the privileged intelligence of a superior man, a real genius, Counseler Antonio Prado, the president of the Paulista Railroad Company, who with strong convictions always supported me.

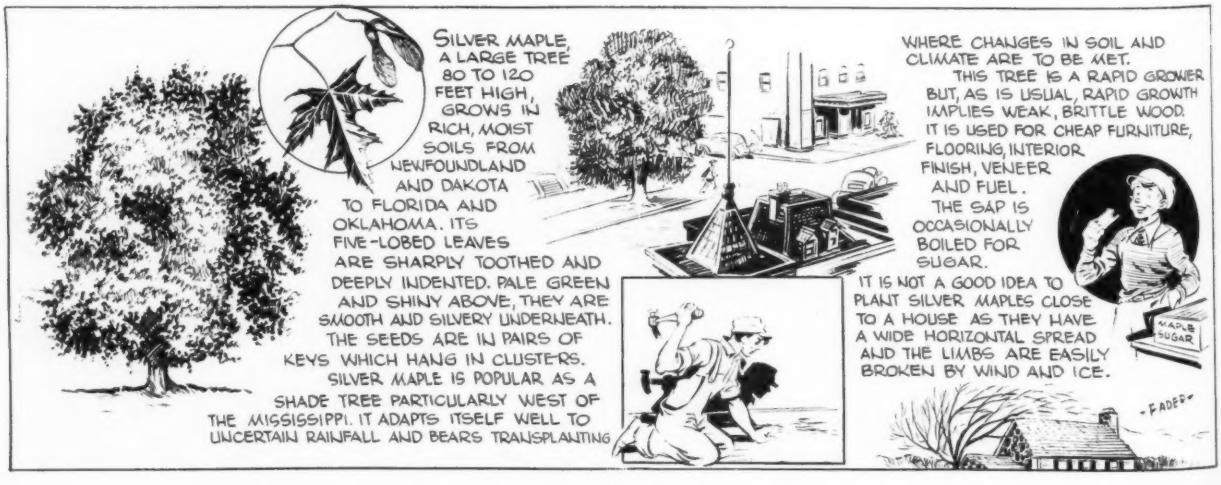
Such faith I have put in my success that my family used to say that besides the eucalyptus nothing else in this world was of interest to me. One day, my mother jokingly told me that I could even know the weight of the leaves which fell from the eucalyptus. "That is one thing," I told her, "I have yet to learn and I'll do it." And for eight years I carefully weighed the leaves which fell on an area previously prepared. I could then verify that the eucalyptus enriches the soil with the falling of leaves, little branches and fruits, with an average weight of 12,500 pounds an acre a year.

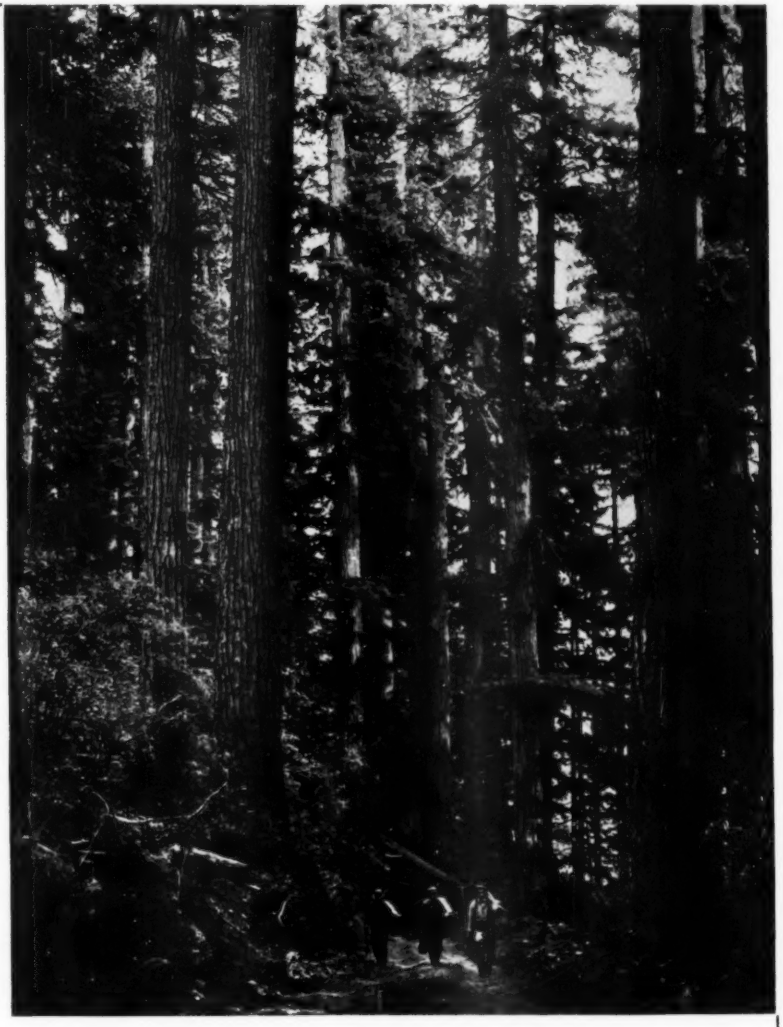
After the great cultivations of the Paulista company arose with trees of 100 to 150 feet in height and two to three feet in diameter, no one could longer deny the prodigious and rapid growth of eucalyptus. There arose, however, a disbelief of its usefulness, of any employment for its timber, even though it were the most lowly use of wood, which is as fuel. The second phase of the campaign then began, longer than the first, and in which the factor time had greater relevance. It was necessary to demonstrate, and this the years have proved abundantly, that the wood of eucalyptus could be applied in any and all services in which any other wood could be employed. I judge myself very fortunate to have been allowed to live and endure long enough to see the completion of my work. Today I can declare with all security that which has for a long time seemed to me a great truth—eucalyptus is the only tree yielding first quality wood that can be utilized by the same man who planted it. This is the thesis that I expressed at the beginning and that the work of the Paulista company goes to confirm.

The first application that we made of eucalyptus was as firewood for the locomotives of our own company. I may explain that wood is the fuel most employed by the railroads of my country. Brazilian coal cannot be compared with the foreign coal, the importation of which would be a financial burden. From 1915 to 1925 innumerable experiments were made with the wood of various species of eucalyptus in order to clarify this point definitely. The results exceeded expectations, even the most optimistic, and since 1927 the Paulista company has been using eucalyptus on a large scale for locomotive fuel. Its Forest Service has delivered to the locomotives about 2,000,000 cubic meters of eucalyptus firewood, which is the equivalent of 250,000 tons of coal or 560,000 cords.

(*Continuing on page* 351)

TREES AND THEIR USES—No. 57—SILVER MAPLE


SILVER MAPLE, A LARGE TREE 80 TO 120 FEET HIGH, GROWS IN RICH, MOIST SOILS FROM NEWFOUNDLAND AND DAKOTA TO FLORIDA AND OKLAHOMA. ITS FIVE-LOBED LEAVES ARE SHARPLY TOOTHED AND DEEPLY INDENTED. PALE GREEN AND SHINY ABOVE, THEY ARE SMOOTH AND SILVERY UNDERNEATH. THE SEEDS ARE IN PAIRS OF KEYS WHICH HANG IN CLUSTERS. SILVER MAPLE IS POPULAR AS A SHADE TREE PARTICULARLY WEST OF THE MISSISSIPPI. IT ADAPTS ITSELF WELL TO UNCERTAIN RAINFALL AND BEARS TRANSPLANTING WHERE CHANGES IN SOIL AND CLIMATE ARE TO BE MET.
THIS TREE IS A RAPID GROWER BUT, AS IS USUAL, RAPID GROWTH IMPLIES WEAK, BRITTLE WOOD. IT IS USED FOR CHEAP FURNITURE, FLOORING, INTERIOR FINISH, VENEER AND FUEL. THE SAP IS OCCASIONALLY BOILED FOR SUGAR.
IT IS NOT A GOOD IDEA TO PLANT SILVER MAPLES CLOSE TO A HOUSE AS THEY HAVE A WIDE HORIZONTAL SPREAD AND THE LIMBS ARE EASILY BROKEN BY WIND AND ICE.
MAPLE SUGAR
FADER



WEYERHAEUSER FOREST PRODUCTS — TIMBER IS A CROP

TREES AND MEN BEHIND THE GUNS

TREES AND MEN are on the march. In the woods of America, all the way from Penobscot to Puget Sound, an army of men is working at jobs strange to urban ears—men called fallers and buckers and bullcooks and choker-setters and chasers and whistle-punks and cat-punchers. Down at the mills, on water front, and in valley is another army of men—setters and doggers, stickermen and feeders, picaroonists and off-bearers. In logging camp and sawmill office is still another army—managers, superintendents, foremen, salesmen, all working on production demands and production possibilities—all out to maintain the magnificent record the American lumber industry has made to date on the National Defense program.

In June, 1940, America had a standing army of 232,000 men, and bare acres of cantonment sites. July, 1941, sees an army of 1,418,000 housed in 45 cantonments, made up of 44,500 buildings erected by 350,000 carpenters. These are lumber buildings, Trees and Men behind the Guns.

WEYERHAEUSER FOREST PRODUCTS

TACOMA, WASHINGTON SAINT PAUL, MINNESOTA NEWARK, NEW JERSEY

Published in the interest of the Forest Products Industry

VOLUNTEER SPECIALISTS TO DEFEND OREGON FORESTS

By JOHN B. WOODS

The one-lick method in use on the fire line

MORE THAN two hundred young huskies from all parts of the U. S. A., most of them forestry students, have signified their craving to fight fire in Oregon during the summer of 1941. In other words, they want to join up with Professor Schroeder's "Red Hat" shock troops, an organization which made an outstanding record for specialized fire fighting in 1940. Although no publicity has been given to this year's plans, word has seeped about among the colleges and there has been a steady trickle of unsolicited applications from students in a dozen or more institutions in various parts of the country. Asked about the meaning of this and his attitude toward it, Prof. Schroeder shrugged his shoulders and said, "Well, evidently the undergraduates don't get much kick out of summer fire fighting back east. Some of these applicants are football hopefuls and we don't discriminate against good athletes, providing they are forestry students or sincerely interested in forestry as such. Inasmuch as our plans are still incomplete, we haven't accepted any applications, but will consider them in due time in the order of their receipt."

Shock troops are, by tradition, volunteers. In defending the forests, as in military operations, the lightning, overwhelming attack and the systematic follow-up have become standard practice where conditions are most severe. Such a service demands specially qualified men—young, aggressive, vigorous, resourceful and willing to pull with the team. Since this particular enterprise began in 1940 as a plan to give summer employment to the first and second year students in forestry at Oregon State College, and since there are literally hundreds of forestry students and high school prospects in northwestern colleges who would like to enlist for 1941, it goes without saying that serious interest in forestry is also a prerequisite.

The basic organization unit last year was a squad of four men with a strawboss. One strawboss in each group of ten men was designated ranking officer, and a foreman was assigned to each crew of twenty-five men. The men were trained and equipped to apply the one lick, or progressive, method of fire line building. They were housed at the Arboretum Camp near Corvallis and each underwent a training period, divided between classroom and field instruction. Because the month of June was dry, many of the men received their field training on actual fires.

The National Youth Administration underwrote the project to the extent of paying each man $1.00 a day to work on a forest sanitation program on the McDonald State Forest, it being agreed that this stipend would enable the men to pay board and have a little spending money, but that such payments should be suspended for the periods of actual fire fighting employment. The average earning of 113 men, who passed through the camp, was $120 a man over and above expenses, for an average enrollment period of fifty-three days. In addition, twenty-four men were placed in summer jobs with protection agencies, and made good.

It is planned to expand the program considerably for 1941. The recruiting and training camp will be maintained at Arboretum, where also will be a twenty-six-man crew. A 26-man unit will be located at Birkenfeld in the Nehalem River Valley and another at Camas Mountain in the southern mountain area. A third side camp will be located at Ski Lodge near Sisters in eastern Oregon. It is necessary, of course, that these camps be located on public land, preferably state parks or state or national forests, where sanitation work can be undertaken, to permit N.Y.A. sponsorship. Each crew will be provided with its own transportation units.

As in 1940, employment will be on a pay-as-used basis, wage rates to be those of organized crews. In this way the protection agencies, Federal, State and private, are able to draw upon specially trained crews as needed without having to bear the extremely high costs of maintaining such specialist organizations throughout the entire fire season. In order that the men may be assured of reasonable incomes during June and September, the months when fires usually are less prevalent, the private protection agencies within the service area of each camp have agreed to guarantee employment sufficient to yield minimum earnings approximately equal to the contribution of the N.Y.A. Whatever work they do over and above such minimum periods will, of course, be paid for at the same standard wages. July and August can be depended upon to provide enough fires to furnish fairly steady employment for at least three twenty-six-man crews.

Arboretum Camp in 1940—loading tools and men with bedrolls into transport units. The get-away time is five minutes

CONSERVATION CALENDAR

Important Bills in Congress With Action—May 15 to June 17, 1941

APPROPRIATIONS

H. R. 3735 — CANNON — Making appropriations for the Department of Agriculture for the fiscal year June 30, 1942. Passed House March 6, 1941. Passed Senate amended April 3, 1941. In Conference April 17. Conference report submitted in the House June 17, 1941.

H. R. 4590—TAYLOR—Making appropriations for the Department of the Interior for the fiscal year ending June 30, 1942. Passed House May 14, 1941. Passed Senate June 3, 1941. In conference June 5.

H. R. 4926—TARVER—Making appropriations for the Department of Labor, the Federal Security Agency, and related independent agencies for the fiscal year ending June 30, 1942. Passed House June 5, 1941. Reported with amendments by the Senate Committee on Appropriations June 16, 1941.

CONSERVATION

H. R. 3793—HOOK—To safeguard and protect the public interest through the creation of conditions under which the remaining uncut stands of timber of the hemlock hardwood types in the northern parts of Michigan and Wisconsin can be conserved and utilized. The House Committee on Agriculture held public hearings on this bill June 10 and 11, 1941.

NATIONAL FORESTS

H. R. 4205—IZAC—To add to the Cleveland National Forest, California, certain contiguous lands of the United States which can be most effectively and economically protected and administered as parts of said national forest. Passed House May 19, 1941. Referred to the Senate Committee on Public Lands and Surveys May 20, 1941.

NATIONAL MONUMENTS

S. 260—HAYDEN—(H. R. 2675—MURDOCK)—To permit mining within the Organ Pipe Cactus National Monument in Arizona. Passed Senate May 23, 1941.

S. 752—HAYDEN (H. R. 1063—MURDOCK)—To provide for the establishment of the Coronado International Memorial in Arizona. Passed Senate amended May 26, 1941.

PUBLIC DOMAIN

S. 633—VAN NUYS—To amend the Criminal Code in respect to fires on the public domain or Indian lands or on certain lands owned by the United States. Passed Senate June 9, 1941.

ANOTHER CASE WHERE INDIANS WOULD COME IN HANDY!

Snake and Buzzard Blamed for Blaze

By United Press

HOLLYWOOD—A buzzard and a snake were blamed today for a brush fire which threatened homes in Weldon Canyon, north of here.

Three witnesses told Assistant Fire Chief F. W. Moore that the buzzard was flapping overhead with a long snake in its beak. The snake became entangled in a high tension power wire, sent an electrical charge into the buzzard, set the bird's wings afire and resulted in the brush blaze when the burning buzzard flopped to the ground.

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CONSERVATION IN CONGRESS

THE extent to which Congress will consider major forestry legislation in this session of Congress is clouded by increasing national defense activity and possibility of this country entering the war. So far, little forestry or conservation legislation has been considered. With Congress remaining in session all summer there is some possibility that certain forestry legislation will reach the committee-hearing stage and even consideration on the floor.

Appropriation Bills

The conference report on the Agricultural Appropriations bill for the 1942 fiscal year was submitted to Congress June 17. The Forest Service appropriation of $18,589,609 is $541,654 greater than for the 1941 fiscal year, which ended June 30. The conferees agreed on the cooperative forest fire prevention item at $2,425,000, a $225,000 increase over the last fiscal year. White pine blister rust control funds were placed at $1,284,000, of which $483,332 is allocated to the Bureau of Entomology and Plant Quarantine; $685,668 to the Forest Service and $115,000 to the Department of the Interior. This represents an increase of $240,000 over current year funds. The cooperative farm forestry item remains at $700,000, the entire $300,000 increase over the last fiscal year being earmarked for the shelterbelt. Funds for national forest land acquisition were boosted to $1,797,348, as compared to the $1,000,000 appropriation in the last fiscal year.

The item for Dutch Elm disease control was cut to the House figure of $300,000 which is $100,000 less than was available last year. The $10,000 Senate increase for Forest Pathology was retained and is earmarked for cactus disease investigations of the sagauro and organ pipe cacti of the Southwest.

The forest products research item was agreed upon by the conferees at $782,500, an increase of $150,000, over last year. The $50,000 Senate increase in the forest management research item, earmarked for selective cutting demonstrations in the Douglas fir region was disapproved, while the $23,000 Senate increase for Naval Stores investigations was retained. Funds for the construction and maintenance of forest roads and trails were agreed upon at $9.990,165 as compared with an even $9,000,000 in the last fiscal year. The Soil Conservation Service appropriation was increased to $23,516,775 an increase of $4,724,235 over the last year's appropriation.

The Interior Department Appropriation bill, H. R. 4590, was passed by the House on May 14, by the Senate on June 3, and sent to Conference June 5. While the Budget estimate for the national park service was cut $27,105 by the House, it was increased $163,150 by the Senate, to a total of $14,629,925. This amount includes $6,000,000 for continued construction of the Blue Ridge, and Natchez Parkways; $3,000,000 for construction of roads and trails in national parks; and $75,000 for the encouragement of travel in the United States. The $125,000 House cut in the soil conservation item was restored by the Senate to the extent of $53,700, to a total of $2,178,700. The Fish and Wildlife Service appropriation was cut by the House to $7,719,175 and increased by the Senate to $8,582,200. The House increase of $25,000 for the Grazing Service, bringing that item to a $1,125,000 total, was approved by the Senate. Budget estimates for other conservation agencies in the Interior Department were approved by both Houses, including administration of O and C lands in Oregon at $200,000, and Indian forests at $517,000.

CCC and WPA

The Labor-Social Security appropriation bill, H. R. 4926, as passed by the House on June 5, contains a $246,960,000 item for the Civilian Conservation Corps as compared with the $270,000,000 Budget estimate. In recommending this cut the House Appropriations Committee said, "The repercussions of the defense program are being reflected in the operations of the CCC. . . . . It now appears plainly evident in the light of employment opportunities in private industry opening up for the youths that would otherwise avail themselves of this training, that it will not be possible for the Civilian Conservation Corps to enroll the number of youths provided in the Budget's submission." The number of CCC enrollees for the coming fiscal year is estimated at 232,500. The appropriation as passed by the House contemplates a reduction in the number of CCC camps from 1,500 to 1,236.

Expenditure of a limited amount, not to exceed $5,000,000, for federal non-construction projects is provided in the reduced WPA appropriations bill, H. J. Res. 193, passed by the House on June 13. In previous years federal non-construction projects included WPA participation in white pine blister rust control, Dutch elm disease eradication, and the shelterbelt forest planting project of the central states, as well as other projects, for which $45,000,000 is available in the current fiscal year. Should the appropriation of $5,000,000 for non-construction projects in the next fiscal year be maintained by Congress, practically no WPA funds will be directly allocated to the Bureau of Entomology and Plant Quarantine or the Forest Service for these projects. However, these agencies may be able to participate in state WPA allotments to the extent that federal supervision can be supplied.

Contained in the War Department Civil Functions Appropriation Act, Public Law

71, is an item of $998,342 to be transferred and made available to the Secretary of Agriculture for preliminary examinations and surveys on the watersheds of flood control projects.

Amending the U. S. Criminal Code in respect to fires on government owned land, S. 663, introduced by Senator Van Nuys of Indiana, was passed by the Senate on June 9. The bill provides up to $5,000 in fines, or five years imprisonment, or both, for incendiaries who wilfully set fires to any timber, underbrush, or grass on federally owned lands, and a maximum penalty of $500, or imprisonment for six months, or both, for anyone who builds a fire and permits such fire to spread to federally owned lands.

The Hook Bill

On June 10 and 11, a subcommittee of the House Agriculture Committee held a hearing on Representative Hook's bill, H. R. 3793, authorizing the Reconstruction Finance Corporation to loan up to $30,000,000 to enable the Secretary of Agriculture to purchase not to exceed 1,500,000 acres of hemlock-hardwood forest in Northern Michigan and Wisconsin and to add them to existing national forests. The hearing was called prior to receipt of a report from either the Bureau of the Budget or the Secretary of Agriculture. Representative Hook's bill is similar to a bill in the 76th Congress, disapproved by the Budget, but he expressed hope that with one small and acceptable amendment, it would have the approval of Federal Loan Administrator Jesse Jones and Budget Director Harold Smith. Supporting Representative Hook in requesting favorable action on the bill was Raymond Dick, of the "Save the Porcupine Mountains" Association, Ironwood, Michigan; George E. Bishop, secretary-manager of the Upper Michigan Development Bureau; and others from that region.

Organ Pipe Monument

Over the opposition of conservation organizations, the Senate, on May 23, passed the Hayden bill, S. 260, to permit mining within the Organ Pipe Cactus National Monument in Arizona. Its companion bill, H. R. 2675, sponsored by Congressman Murdock in the House, was stricken from the consent calendar June 1. Consideration of the bill was objected to by Congressmen Cole, Kean, and Angell. Objection to the bill on the part of conservationists is that it will nullify the purposes for which the monument was established and will set a precedent for further violation of the purposes for which the national monuments and parks are created. (See story on page 349.)

Flood Control

Constitutional authority for federal regulation of flood control has been extended to include the tributaries of navigable streams in the case of Oklahoma v. Atkinson, et. al., handed down by the U. S. Supreme Court on June 2, 1941. In view of the New River decision of last December, which was reviewed in the March, 1941, issue of AMERICAN FORESTS, the most recent decision leaves little doubt concerning the constitutional authority of the federal government to regulate practically all of the country's network of rivers, streams and tributaries.

The latest case is similar to the New River case in that it involves the constitutionality of the federal government to construct a dam across what is alleged to be a "non-navigable river." Regarding federal powers of flood control and watershed control the Court, in the case of Oklahoma v. Atkinson, said:

> "There is no constitutional reason why Congress cannot under the commerce power treat the watersheds as a key to flood control on navigable streams and their tributaries. Nor is there a constitutional necessity for viewing each reservoir project in isolation from a comprehensive plan covering the entire basin of a particular river. * * * * We have recently recognized that 'Flood protection, watershed development, recovery of the cost of improvements though utilization of power are . . . . parts of commerce control.' *And we now add that the power of flood control extends to the tributaries of navigable streams.* For just as control over the non-navigable parts of a river may be essential or desirable in the interests of the navigable portions, so may the key to flood control on a navigable stream be found in whole or in part in flood control on its tributaries."

Fire Fighters Attention

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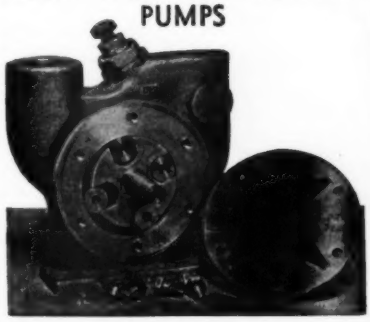

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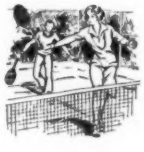

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YOUR SHADE TREES: By SAMUEL N. BAXTER

WHY A STREET TREE CENSUS?

SEVERAL years ago when Jacques Greber, the famous landscape architect of Paris, was in Philadelphia in connection with laying out the Benjamin Franklin Parkway, we discussed the problem of street trees. I cited Washington, D. C., to Mr. Greber as our best example of the benefit of municipal—or governmental, in this case—control of street trees in a city. Mr. Greber's reply was, "Washington is not a city, it is a garden." So coming from an expert you can appreciate the contributory part street trees play in making a city beautiful and attractive to visitors.

Individuals and garden clubs that advocate and work to bring about the municipal control of street trees are worthy of a place in the hearts of their fellow citizens, because the city or town that fails to have jurisdiction over the trees on its public streets and highways, is missing one of the best opportunities to "a city beautiful."

Interest in tree planting of highways is increasing each year and many cities and towns already have a shade tree commission, or at least a tree warden. Even in the absence of funds to perform the actual work of planting, removing, pruning, spraying and fertilizing, a commission or an arboriculturist should function to issue permits and should have power to enforce regulations for the protection of street trees; to encourage tree planting and to give expert advice to property owners on the care of trees so that haphazard planting or setting out of inferior species may be eliminated.

Assuming that proper legislation is enacted, a city ordinance passed for the protection of street trees and a shade tree commission appointed, the first step after assuming control should be the taking of an inventory of all existing trees, their kind, condition, distance apart, location by house numbers and any other information likely to prove helpful as office records. Paced rather than taped measuresurements may be made of distances between trees, to expedite the census taking and reduce the cost. Census sheet forms, filled in on the streets, may be used subsequently as office reference and working records. These sheets are numbered according to the number of sections into which the city is first divided and then filed alphabetically in each section.

In 1912, when the Commissioners of Fairmount Park, by virtue of an Act of Assembly of 1907, supplemented by local ordinances, assumed control of the street trees of Philadelphia, I was invited to become arboriculturist in charge of the department. My first act was to "take stock," or direct a census of street trees. This was probably the first systematic census of street trees in any large city and the 127,301 trees recorded exceeded in number at that time such tree famed cities as Paris and Washington. This number, allowing for removals and not counting replacements, has increased to 159,843 as of January 1, 1941. These census sheets, with detailed information and space for twenty-five trees, are still in use and helpful as an office file. New plantings and removals are plotted daily from permits issued and the records kept up to date.

The need of a street tree census has advantages other than for estimating purposes in preparing a budget for an appropriation for maintenance. Consulting census sheets, after a telephone complaint of insect infestation, will frequently enable the identification of an insect by the kind of tree infested (insects have their favorite host plants), so that the time of sending an inspector is saved and an order is issued to the spraying crew as to the type of insecticide needed.

An inquiry as to what kind of tree to plant, or whether there is room for a tree, may also be answered by consulting the census sheet. Thus much time is saved by not having to send out an inspector for the information. Or if the census sheet shows a tree hopelessly decayed or dangerous, an application for a permit to remove it may be issued without a visit to investigate.

We make no charge for permits to plant, remove, spray or prune trees, but despite this, a property owner will sometimes object to what he calls "red tape." If a tree has died, for instance, the property owner may feel that a permit for its removal is unnecessary. Aside from the specifications on such a permit to protect property and passersby from careless or inexperienced workmen, the permit to remove is recorded on the census sheet. Without this our records would show the tree existing and should application be made to plant a tree, there would appear to be no room for it.

The owner who objects to the "red tape" of getting a planting permit is shown the advantages, one of which is that his neighbor would not be allowed to plant a Carolina Poplar—which is tabooed—to some day cause him expense from roots clogging his drain pipes or raising his cement walk. Permits are, therefore, necessary

These pin oaks on a street in old Philadelphia have been greatly improved by the removal of the lower branches to a uniform height

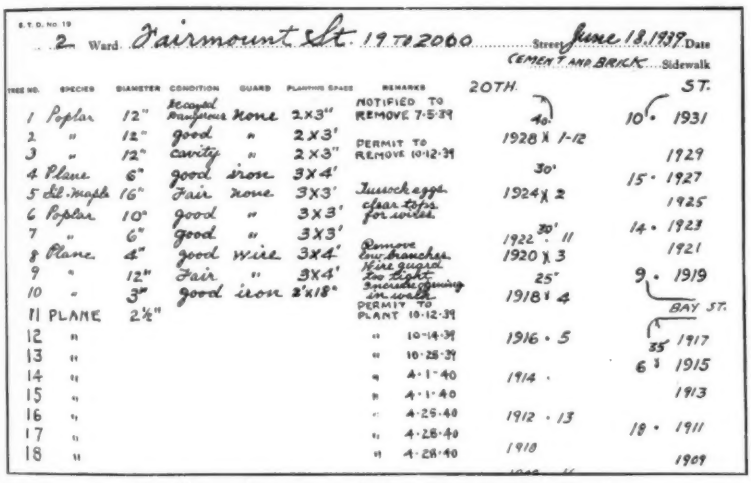
for coordination of systematic planting, removals and maintenance. Other advantages of this "red tape" of municipal control of street trees are that property owners not only have the free advice of tree experts at their command, but a shade tree commission serves as a "clearing house" to bring about the free replacement of trees knocked over by automobiles and trees destroyed by leakage in gas mains or other agencies which frequently cause the death of street trees.

Planting permits to property owners specify the kind of tree, minimum size and other details covering the planting, and a copy is sent to the various police districts for their information and verification of planting, especially as to the size of trees planted. The generally accepted policy of confining each block or square to one kind of tree not only makes for uniformity in appearance, but also economy of maintenance.

the gardener. This insures proper workmanship before the job is paid for.

Sometimes a property owner will want a tree cut back too severely. In such cases the gardener with permit, even though the owner pays for the work, is cautioned that he is working for the Commission and that unless its standard of workmanship is observed, he will not receive permits in the future.

In Philadelphia the appropriation by City Councils is for care or maintenance, like spraying, pruning, watering and inspection service. There is no charge for this to property owners. The Act, providing for a shade tree commission, specifies that the cost of planting or removing trees is borne by the property owner. Although the Commission will do this work at cost, it is preferred to have property owners engage their gardeners or nurserymen by applying for a permit, with specifications thereon. There is no charge for permits.



E. T. D. No. 19

2 Ward. Fairmount St. 19 to 2000 Street. June 18, 1939 Date. CEMENT AND BRICK Sidewalk

TREE NO.	SPECIES	DIAMETER	CONDITION	GUARD	PLANTING SPACE	REMARKS
1	Poplar	12"	Decayed trunk	None	2X3"	NOTIFIED TO REMOVE 7-5-39
2	"	12"	good	"	2X3'	
3	"	12"	Cavity	"	2X3"	PERMIT TO REMOVE 10-12-39
4	Plane	6"	good	iron	3X4'	
5	Sil. Maple	16"	Fair	None	3X3'	Tussock eggs. clear tops for wires
6	Poplar	10"	good	"	3X3'	
7	"	6"	good	"	3X3'	
8	Plane	4"	good	Wire	3X4'	Remove low branches. Wire guard for light. Sprouts growing in center
9	"	12"	Fair	"	3X4'	
10	"	3"	good	iron	2'x18"	
11	PLANE	2½"				PERMIT TO PLANT 10-12-39
12	"					" 10-14-39
13	"					" 10-25-39
14	"					" 4-1-40
15	"					" 4-1-40
16	"					" 4-25-40
17	"					" 4-26-40
18	"					" 4-28-40

20TH. ST.

40' 1928 X 1-12 10 · 1931

1929

30' 1924 X 2 15 · 1927

1925

30' 1922 · 11 14 · 1923

1921

1920 X 3

25' 1918 X 4 9 · 1919

BAY ST.

1916 · 5 35 1917

6 3 1915

1914 ·

1913

1912 · 13 18 · 1911

1910

1909

On this specimen census sheet, trees 1 to 10 represent the original census and 11 to 18 the later planting of Plane trees, which had been originally used in the block

In 1940 the Commission sprayed over 30,000 street trees, mostly in response to requests of property owners for this service. Infestations were mostly Tussock moth caterpillars, bag worms and Japanese beetles. Response to such requests are not confined to spraying the tree complained of, but trees in the entire block are sprayed. Property owners desiring special or immediate service may engage their own gardener to spray trees after obtaining a permit.

Where appropriations for maintenance are inadequate to prune all trees, property owners are allowed to engage experienced gardeners to do special pruning, if it is deemed necessary. In such cases the owner deposits the estimated cost of the pruning with the Commission and designates the name of the gardener. An order is then given to the gardener by the Commission and after the work is inspected and approved, the amount deposited is paid to

A list of the best trees for city sidewalk planting would naturally vary in different parts of the country. Study the trees of your locality and favor those that are the most satisfactory. Do not make the mistake that because a tree on your suburban or country lawn is healthy and satisfactory, it will grow equally well under the adverse soil and atmospheric conditions of a mid-city sidewalk. Or that a tree you have admired in some other climate is just the one for your sidewalks. Be guided by the advice of your local authorities.

Above all, advocate the creation of a shade tree commission—if you do not already have one—in your city or town. Let your streets be tree lined. It will beautify your city and enhance property values. If you cannot have a shade tree commission, organize the property owners of your street to plant trees as an example and to make the rest of the town tree-conscious.

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FEDERAL NEWS AND REVIEWS

A "RADIO-WAVE SPRINKLER," a new device which has proven successful in tests during the past year, will be used to aid fire fighting crews on the national forests this summer, the Department of Agriculture has announced.

The sprinkler, developed by the federal Forest Service, will facilitate emergency communication in the forests. It is known technically as an automatic relay station in that it picks up radio waves from one point and transmits them to another, and is the first known development of an automatic relay of portable size operated by dry batteries.

In fire control work in mountainous country of the western national forests, the automatic relay or wave sprinkler can be used to make communication with headquarters certain. When the small portable radios carried by forest officers on fire patrol can not send their waves over the mountain, they contact the sprinkler which automatically turns on its transmitter and re-broadcasts with a powerful wave to the base station. It will enable the Forest Service to make dependable use of ultra-high frequencies and thus reduce need for use of other frequencies valuable for national defense purposes.

"Forest of Discovery" Approved

The National Forest Reservation Commission on June 4 approved the establishment of a new national forest purchase unit in western Tennessee to be known as the "Forest of Discovery" in commemoration of DeSoto's arrival at the Mississippi River in 1541. The new unit, as approved, will embrace an area of 319,900 acres, of which 167,700 acres are proposed for purchase for approximately $1,675,125.

In addition, the Commission approved for final purchase or exchange 82,068 acres for national forest purposes in twenty-three states, involving an expenditure of $247,930, and included 287 tracts of potential forest land at an average price of $3.83 an acre. Fourteen tracts, containing 12,716 acres, in Utah will be acquired—from forest receipts of $36,565—in the foothills and mountain areas neighboring the Cache, Uinta and Wasatch national forests to aid in controlling floods and erosion.

Approval of the purchase of 1,210 acres of redwood forest along the Klamath River in northern California, at a cost of $39,933, brings the total area of federally owned redwood forest to 12,800 acres with an estimated volume of 350,000,000 board feet. The Commission reports plans for establishing a small experimental forest for propagation and management studies.

A memorandum, "authorizing the For-

est Service to follow, in the case of exchanges under the act of March 3, 1925, or acquisitions under other acts requiring approval by the Commission, the procedure approved by the Commission relating to lands approved for purchase under the Weeks Law as amended," was tabled pending further study.

Also tabled were recommendations for the purchase of 4,110 acres within the San Bernardino and the Cleveland national forests of California at a cost of $13,445, and of 2,629 acres within the Nevada National Forest at a cost of $7,888.

Bighorn Sheep Making Last Stand

With only 14,000 bighorn sheep remaining in the United States, according to a report of the Fish and Wildlife Service of the Department of the Interior, federal, state and private conservation agencies are bending every effort to save this big game animal, which once flourished in most mountain ranges of the West, from extinction.

In the latest Fish and Wildlife Service big game inventory it was estimated that in 1939 there were only some 8,350 Rocky Mountain bighorns and 5,350 desert bighorns in the country.

Some 2,500 Rocky Mountain bighorns were in Wyoming, 2,300 in Colorado, 1,700 in Idaho, 1,200 in Montana, 360 in California, 250 in Utah, thirty in Oregon, twenty in Washington, and three in New Mexico. The desert bighorn population included 2,000 in California, 1,800 in Arizona, 1,100 in Nevada, 250 in New Mexico, and 150 in Texas.

The Fish and Wildlife Service administers four national wildlife refuges primarily for the protection of Rocky Mountain and desert bighorns. The Kofa and Cabeza Prieta game ranges in Arizona now have an estimated population of 150 bighorns. The Desert Game Range in Nevada reported between 325 and 350 bighorns in July, 1940. The San Andres Refuge in New Mexico was recently established for the protection of Mexican bighorn sheep. Though the Boulder Canyon National Wildlife Refuge in Nevada and Arizona is primarily a waterfowl area, it has more than 350 bighorns.

CCC to Intensify Defense Training

James J. McEntee, director of the Civilian Conservation Corps, on June 17 forwarded to all CCC administrative, supervisory, and training personnel, instructions to intensify all Corps national defense training activities. In a revised CCC training directive, which restated the Corps' objectives and training methods in the light of the needs of the national emergency, Director McEntee called for utilization of all available facilities in the preparation of young men for greater national defense usefulness.

The specific objectives of the CCC were listed as the building of strong healthy bodies, the training of men to live, work, and play together, the teaching of good work habits, the training of men in specific national defense skills which open the way to employment, and the inculcation into all enrollees of "an understanding and appreciation of our form of government and the opportunities and responsibilities of citizenship."

The CCC training plan was forwarded to all Army Corps areas, all regional offices of the Department of the Interior and the Department of Agriculture, and to all CCC camps now in operation. The Departments of War, Interior, and Agriculture cooperate with the Office of the Director, Civilian Conservation Corps, in administering the program.

Rodent Repellent Beans

The rattle-bush is a leguminous shrub which grows in waste places from Florida to Arkansas and Texas. This bush, *Daubentonia drummondii* Rydt., is planted for ornamental purposes because of its handsome flowers, but no other economic use is known for it. However, tests of the beans of this bush, made at the request of the Hillculture Division of the Soil Conservation Service, indicate that they may have value for repelling rodents. The bush bears heavy crops of beans and these seeds are known to be very poisonous to sheep and goats.

D. Breese Jones, chief of the Protein and Nutrition Research Division, Bureau of Agricultural Chemistry and Engineering, Department of Agriculture, who made the tests, fed rats on standard rations containing meal made from finely ground rattle-bush beans, the proportion of meal in the ration varying from twenty-five per cent down to one-half of one per cent. The animals preferred to die of starvation rather than to eat the test diet, even when the ration contained as little as one-half of one per cent of the rattle-bush meal. The cause for this highly repellent effect on rats is not known but is a matter which rodent-control investigators may wish to determine. It is possible that the rattle-bush bean-meal or its extractives may furnish an effective material for treating nuts and other seeds in field plantings made for erosion control and forestry purposes.

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THE LAST TRUMPETERS, by Elmer Ransom. Published by the University of Georgia Press, Athens, Georgia. Illustrated. 228 pages. Price $2.00.

This is a collection of ten short stories, telling of interesting and exciting incidents in the lives of certain outdoor animals. This book is especially designed for those who love wildlife and enjoy reading about it.

MANUAL OF CULTIVATED TREES AND SHRUBS, second edition, by Alfred Rehder. Published by The Macmillan Co., New York. 996 pages. Price $10.00.

This is a guide to trees and shrubs which are known to be in cultivation and are able to endure the climate of the cooler temperate regions of North America. The second edition has been revised and enlarged, and contains an improved map of climatic zones.

Not only is the book suited to use by nurserymen, but also by anyone seriously interested in horticulture.

MANUAL OF AQUATIC PLANTS, by Norman C. Fassett, Associate Professor of Botany, University of Wisconsin. Published by McGraw-Hill Book Co., Inc., New York. Illustrated. 382 pages. Price $4.00.

This book includes descriptions of hundreds of species of aquatic plants which are to be found from the Gulf of St. Lawrence and Virginia on the east to Missouri and Minnesota on the west. Space has not been given to plants that live exclusively in tidal, brackish, or salt waters. Every page of text faces a page of line drawings illustrating the species described. The appendix contains an informative and valuable treatise on the use of aquatic plants by birds, mammals, and fish.

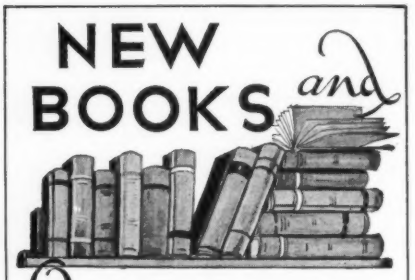
CAREERS IN FORESTRY, by Charles N. Elliott. Published by the Science Research Associates, 1700 Prairie Avenue, Chicago. Illustrated. 48 pages. Price, 50 cents.

This booklet gives a summary of the many branches of forestry which offer careers, explaining the work involved in these branches, as well as the requirements of men entering the field.

Because forest conservation is playing an increasingly important part in our modern civilization, the information in "Careers in Forestry" will be of particular interest to those considering forestry as a life work.

AMERICAN PLANNING AND CIVIC ANNUAL, edited by Harlean James and published by the American Planning and Civic Association, Union Trust Building, Washington, D. C. 278 pages. Illustrated. Price $3.00.

The 1940 Annual presents a brief picture of what has happened of interest during the year in the fields of planning, parks, civic and housing improvements, and it embodies the principal papers presented at the National Conference on Planning held in San Francisco last July.



A list of Selected Books on Forestry and related fields of Conservation is available to members of The American Forestry Association on request.

HOME BY THE RIVER, the Story of Hampton Plantation, by Archibald Rutledge. Published by the Bobbs-Merrill Company, New York City. Illustrated. 167 pages. Price, $3.00.

Here is the story of an old South Carolina plantation house told by the owner, whose ancestors have been the original owners since 1686.

Archibald Rutledge spent his boyhood at Hampton by the Santee River. Schooled in nearby Charleston, he soon went north and there remained until his fifty-sixth year. He returned to restore the old house and property, and says, "When I came to where the gate used to be, I could hardly see the house for the tall weeds and the taller bushes. It was as if the blessing of fecundity had been laid on everything natural, and on everything human, the curse of decay."

But it was more than a mere desire to restore the ancestral home that drew him back, and one catches a glimpse of the true spirit of the author in passages like the following: "Such incidents as I have described suggest the adventurous nature of my boyhood days, and while some people might have been glad to get away from such an environment, the magic of it all was in my blood: the birds, the animals, the strange reptiles, the lonely mystery of the river and wood and swamp. They were a part of my heritage, and to them I longed to return."

The reader feels the warm southern air, and sees the massive moss-draped cypresses and live oaks, as Mr. Rutledge describes the work of restoring the house, of planting long avenues of holly and dogwood and magnolias. He gives vivid word pictures of the surrounding wildwood and the life that inhabits it.

Archibald Rutledge, nature lover and writer, is at his best in this fascinating story of the South.

The publications listed below must be ordered direct from the addresses as given and not through the Association.

Forestry Abstracts—published by the Imperial Forestry Bureau, Oxford, England.

Oklahoma's Forest Resources, by E. L. Demmon. Sou. For. Exp. Sta., New Orleans, La.

Report of the Secretary of Agriculture, 1940. Supt. of Docs., Washington, D. C. Price 15 cents.

Wildlife Review. Fish and Wildlife Service, Dept. of Int., Washington, D. C.

Annual Report, Director of the Civilian Conservation Corps, 1940. Supt. of Docs., Washington, D. C.

Documents Relating to the Administration of Occupied Countries in Eastern Europe. No. 1—The German Exploitation of Polish Forests. Polish Information Center, 151 East 67th Street, New York City.

Forest Products Statistics of Central and Prairie States, compiled by R. V. Reynolds and A. H. Pierson, For. Serv., Dept. Agr. Sta. Bull. No. 173. Supt. of Docs., Washington, D. C. Price 15 cents.

Science—Servant of Agriculture, by C. B. Hutchison and S. B. Freeborn. Report of Agri. Exp. Sta., College of Agriculture, Univ. of Calif., Berkeley, Calif.

Design and Development of Picnic Grounds, by Laurie Davidson Cox. Bull. 21, N. Y. State College of Forestry, Syracuse, N. Y.

The Protection of Nature in the Americas, by Dr. Wallace W. Atwood. Pan American Institute of Geography and History, Av. 16 de Septiembre 54, Mexico, D. F.

Handbook for Range Managers, Region 5, 1940, by R. W. Beeson, F. P. Cronemiller, R. L. Deering, A. Fausett, E. P. Meinecke, P. P. Pitchlynn, S. B. Show. U. S. Dept. of Agr., U. S. For. Service, Calif. Region, 760 Market Street, San Francisco, Calif.

The Classification of Land. Proceedings of the First National Conference on Land Classification. Bull. 421, Univ. of Missouri, Coll. of Agr., Agr. Exp. Sta., Columbia, Mo.

Beech, Its Production, Properties, Uses, Seasoning and Treatment, by R. J. Hoyle, H. L. Henderson, J. O. Blew and N. C. Brown. Tech. Pub. No. 51, N. Y. State College of Forestry, Syracuse, N. Y.

Shrubs for Wildlife on Farms in the Southeast, by Verne E. Davison, Soil Cons. Serv., Leaflet 200, U. S. Dept. of Agr., Supt. of Docs., Washington, D. C. Price 5 cents.

Lumber Distribution and Consumption for 1938, by R. V. Reynolds and A. H. Pierson. Forest Service, U. S. Dept. of Agr. Misc. Pub. 413. Price, 15 cents.

Not Guilty. An official inquiry into the charges made by Glavis and Pinchot against Richard A. Ballinger, 1909-1911, by Harold L. Ickes. Govt. Printing Office, Wash., D. C.

REPLENISHING BRITAIN'S FORESTS

BY ARTHUR TURNER

TO the countryside, as well as to the cities and towns of Great Britain, the war has brought big changes. In 1914-18, nearly 500,000 acres of the British countryside were denuded of their timber, and the same story is happening again.

Timber is needed by the British forces for a variety of purposes. It is used for building Army and R. A. F. huts and hangars, for fuel, for strengthening the dugouts that are now part of Britain's coastal defenses, and to some extent in the construction of aircraft.

Commercially, too, it is a wartime asset. It can be used in the production of synthetic motor spirit, and it can be turned into threads for weaving into fabrics. Altogether, there are nearly 5,000 different uses for timber.

Britain's woodlands and forests are therefore being rapidly whittled down. The work has not yet reached its climax, but already steps are afoot to ensure that the woodlands shall resume their peacetime splendor with the least possible delay. The work of re-afforestation is in the hands of the Forestry Commissioners.

This body was set up as far back as 1919, and the task of replenishing Britain's own timber reserves therefore has a good many years of experience and preparation behind it. Since 1919, the British Government has provided up to £500,000 a year, for afforestation, and tree nurseries have become well established. The commissioners themselves also make grants for afforestation by private enterprise.

Britain's "tree farms", now busier than ever, rear seedlings by the thousand. A single acre of forest, with trees four feet apart, requires 2,700 plants, and the Forestry Commission alone is planting more than 1,500 acres a month. Only about one seedling in every three reaches a sufficiently high standard for transplanting as a forest tree. So around 600,000,000 seedlings are needed for a year's work.

During the last few months, tree nurserymen have been busily engaged in starting new forests all over England. The work is by no means confined to the areas that have been denuded of their timber for war purposes. Forests are springing up on land where trees have never grown before. The arboriculturalists tackle the task scientifically, and they have produced hardy species that can withstand the rigors of high altitudes and exposed positions.

They start the operations with seeds, some of which come from the Empire. In some instances, Germany has assisted in the work. The Forestry Commission a few years ago was using acorns from the German forests as the seeds for oaks to be cultivated and then planted in Great Britain. Most of the trees planted, however, are not oaks, but conifers.

Systematic methods enable the selected, healthiest seedlings to be planted very quickly in rows. They are clamped to a board, with an equal space between each plant, and the board is placed on the ground, with the roots of the midget trees towards the earth. The roots are then covered with soil, and the clips removed. A row of trees is thus planted quickly, neatly, and without injury to the plants.

The plans at present in progress have the year 1950 as their climax. About 1,500,000 acres are to be planted between now and that date. For such a program, the tree nurseries will have to produce approximately 4,000,000,000 seedlings.

Thanks to this long-term policy of re-afforestation, Britain may ultimately become one of the leading timber countries in Europe. Germany is cutting her trees much faster than she is planting new ones, and Nazi occupation of other European countries is playing havoc with their timber industries. Britain's re-afforestation work is actually creating new forests at a faster rate than the old ones are being cut down.

WISCONSIN CONSIDERS FOREST REGULATION

Described as an "extension of the soil conservation program", the Wisconsin State Assembly has for consideration a bill to be known as the "Private Forest Regulation Law." Enactment of this bill would require the Conservation Commission to appoint a five-member Committee on Forest Practices and this Committee would "establish such rules and regulations as it finds necessary to stop forest destruction and deterioration and maintain land in productive condition." Not only would its forest practice rules have the effect of law, but the Committee "may also define specifically technical forestry words and terms which are used in forest practice rules."

Farm woodlands whose products are removed for home use, and those where the stumpage value of the timber removed is less than $100 would be exempt. On all other forest lands a basic forest management plan would be required.

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and

SUSAN S. ALBURTIS

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White Oak Becomes State Tree of Maryland

By action of the State Legislature, the white oak, *Quercus alba,* was officially adopted as state tree of Maryland on June 1. Thus Maryland becomes the thirty-first state to adopt a state tree, and the sixteenth to do so by official action.

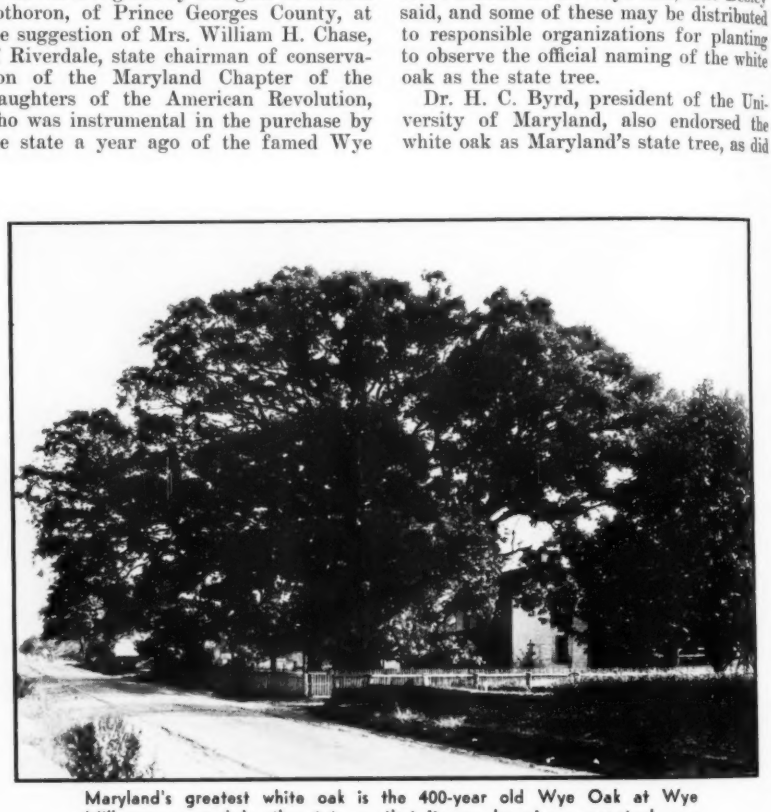
The bill "providing that the white oak shall be the arboreal emblem of the State of Maryland," was introduced in the State House of Delegates by Delegate L. Harold Sothoron, of Prince Georges County, at the suggestion of Mrs. William H. Chase, of Riverdale, state chairman of conservation of the Maryland Chapter of the Daughters of the American Revolution, who was instrumental in the purchase by the state a year ago of the famed Wye Oak at Wye Mills, in Talbot County. This great white oak, which has been taken over by the state for perpetual care, is estimated to be around 400 years old.

"When I discovered that Maryland was without an official symbol tree," Mrs. Chase said, "I started working to bring one about. The white oak was selected because of its great timber value and its beauty, and because the famous Wye Oak, perhaps Maryland's greatest tree, is a white oak. Delegate Sothoron became interested in the proposal and introduced the bill in the State House of Delegates."

F. W. Besley, state forester of Maryland, endorsed the selection of the white oak as Maryland's arboreal emblem. "The selection of the white oak is a happy one," he said. "The white oak is found in all parts of the state, and it is therefore statewide in appeal. Certainly no tree is more sturdy, longer-lived, and more impressive in its proportions than the white oak. The fact that the Wye Oak, which is probably the finest specimen of white oak in the country, has been taken over by the state for perpetual care gives added reason for the selection of this species to represent the state."

The state has at its College Park nursery approximately 1,000 seedlings grown from acorns of the Wye oak, Mr. Besley said, and some of these may be distributed to responsible organizations for planting to observe the official naming of the white oak as the state tree.

Dr. H. C. Byrd, president of the University of Maryland, also endorsed the white oak as Maryland's state tree, as did The American Forestry Association and other organizations.



Maryland's greatest white oak is the 400-year old Wye Oak at Wye Mills, now owned by the state so that it may be given perpetual care

In addition to Maryland, states which have officially adopted a state tree are: California, redwood; Delaware, American holly; Georgia, longleaf pine; Idaho, western white pine; Illinois, bur oak; Indiana, tulip; Louisiana, magnolia; Mississippi, magnolia; Missouri, hawthorn; Pennsylvania, hemlock; Rhode Island, maple; South Carolina, palmetto; Texas, pecan; Utah, blue spruce; and Virginia, flowering dogwood.

States which have adopted state trees without official action are: Arkansas, oak; Colorado, blue spruce; Florida, palm; Kansas, cottonwood; Kentucky, tulip; Maine, white pine; Michigan, apple; Minnesota, white pine; New York, maple; North Carolina, tulip; North Dakota, green ash; Ohio, buckeye; Oklahoma, pecan; Vermont, maple; and Wisconsin, maple.

Commercial Invasion of National Monuments Seen in Pending Bill

LEGISLATION on the verge of passage by Congress is being vigorously opposed by conservation and scientific organizations, which see in it a threat to the integrity of the nation's system of national monuments. The legislation in question is incorporated in the Hayden Bill, S. 260, passed by the Senate on May 23, and the Murdock Bill, H. R. 2675, now on the House calendar. The latter bill has come up for a vote by the House on two recent occasions, but has been passed over upon objections from the floor. Both bills are identical and are designed to open the Organ Pipe Cactus National Monument in Arizona to prospecting and commercial mining. Passage by the House will make the legislation effective unless it should receive a presidential veto.

Leading the opposition is the National Parks Association, defender of maintaining the sanctity of national monuments and national parks. The Association holds that passage will set an opening door precedent for the commercial invasion of other national monuments and it is calling upon all adherents of national park and national monument standards to make a last minute fight against the bill by recording their opposition with their congressmen.

"The legislation would be unnecessarily destructive and set an undesirable precedent for mining in other national monuments," the National Parks Association declared in a statement issued last month.

"According to the organic act that created the National Park Service in 1916, the purpose for which national parks, monuments and reservations are established is 'to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for future generations.' On the sound basis of that act, it has been the settled policy of the federal government that mineral development be forever excluded from these areas.

"Sponsored by Senator Hayden and Congressman Murdock of Arizona, the pending bill to permit mining would, in the opinion of conservationists, nullify the purposes for which the Oregon Pipe Cactus National Monument was established by Presidential proclamation in 1937. The monument is a remarkable scenic area comprising over 300,000 acres of outstanding Sonoran Desert Country. It is situated on the international boundary between the United States and Mexico, and was set aside for administration by the National Park Service to preserve a large variety of plant and animal life peculiar to this desert region.

"The area within the monument has been prospected since the Spanish era of southwestern occupation 400 years ago, but no important mines have been produced and no mines are being operated therein today . . . . In disregard of these facts, a group of small mine operators in Arizona is bringing pressure on Congress to open up the monument for prospecting and mining . . . .

In supporting the bill before the House on June 2, Congressman Murdock said:

"It is one thing to demand that the primitive conditions which we are trying to preserve in national parks, monuments and wilderness areas be not commercialized or destroyed, and I am for exactly that. It is another thing, however, to demand that great natural wealth be locked up over 400 square miles and left untouched, simply that certain designated regions may be said to remain in their primitive condition, especially when it is entirely unnecessary that any such locking up be done.

"As I understand it, the School of Mines at the University of Arizona has reason to believe that at least a fourth of this great area is mineralized, and that there is a fair chance of finding something worth while there.

"What I am attempting to do has been suggested by several Councils of small mine operators in Arizona, which organization has probably 4,000 members in the state made up of prospectors and small claim-holders."

Bequests to The American Forestry Association

There are many members and friends of the Association who find it impractical to contribute to its educational activities during their lifetime. Gifts in the form of a bequest are welcomed. Officers of the Association will gladly consult at any time with those who wish to know more about designating gifts for educational work in conservation.

Following is a paragraph suitable for incorporation in wills:

"I hereby give, devise and bequeath ..... to The American Forestry Association, Washington, D. C., or its successor, or successors, for the purpose of promoting educational activities to bring about a better appreciation and handling of the country's forests and related resources of soil, water and wildlife."

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and
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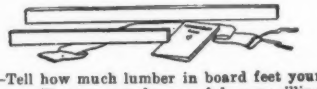

—Tell how much lumber in board feet your logs will saw out by careful saw-milling (the International Log Rule), also what they scale by the Doyle Rule.
—Tell how many 16-foot log cuts there are in standing trees.
—Estimate the contents in board feet (by the Doyle Rule or the more accurate International Rule), of standing trees of the Shortleaf, Longleaf, Slash or Loblolly Pines.
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THE
AMERICAN FORESTRY ASSOCIATION
919-17th St., N.W. Washington, D. C.

We, the People, and the Forests

(*Continued from page* 320)

need never be. Fires like the Tillamook, Oregon, burn of 1933, when 10,000,000,000 board feet of merchantable timber were destroyed, could, in all probability, be prevented were we, the people, to spend a few cents more an acre for fire protection. Closer scrutiny twenty-four hours a day, the year round, will, I think, cut all kinds of fires by two-thirds.

Fire prevention and suppression costs real money in the West. In 1939, we, the people, spent $2,215,000 for fire prevention and suppression in Washington and Oregon. That same year the total federal appropriation for fire prevention and suppression under the Clark-McNary Law for the entire nation was $2,000,000. And yet, we need to invest a lot more money in stopping fires before they start—money for education, for explaining to everybody just why fires should be prevented. We need to invest more money in lookout towers, in air patrols, in fire trails, in pumper trucks, in roadside patrols and in the right kind of men to operate them. Our "Keep Washington Green" and "Keep Oregon Green" programs are public information systems. They are doing genuine good, we believe, but we need more intensive education. We will have it, provided we can get the cooperation of all concerned.

What does all this add up to? Briefly this. Since 1776, we, the people, as represented by the men of the forest industry, have been devoting our Yankee ingenuity to meeting on time the demands of all the American people for forest products. We have tried to be always prepared—prepared to harvest the present crop, prepared to have successive crops coming on and available when needed. The American people have used those products of the forest to build the very institutions we are now defending, institutions which are the inexhaustible source of strength in peace and in war—homes, schools, churches, cantonments, farms, factories and paper.

The men who work side by side in the forest regions of the West, fathers, sons and grandsons, are determined through their Yankee ingenuity and foresight, to continue to meet their full share of the demands of the American people for forest products. They have been doing it for 165 years and the preparations necessary to do it for the next 165 years are now being made. The vast majority of them believe in and are trying to practice the conservation of men and the conservation of trees. We, the men of the West, are pretty certain that with the full, enthusiastic, voluntary cooperation of the men of the federal Forest Service, of the state forestry departments, in fact, of all the people, we can be depended upon to grow an ever-increasing number of trees—trees to be used for the everlasting defense of the nation in peace and in war.

Across Northern Barriers

(*Continued from page* 315)

dle horse and pack train. Like Banff, Jasper has long been developing its own highways but it was not until recent years that a plan to connect the two systems by an automobile road—not *across* the Rockies but *along* the Rockies—took definite form. Begun in 1931, it was finished in the late summer of 1940.

Is Jasper in keeping with the scenes that lead up to it?

The low, rustic buildings of the lodge nestle on emerald green lawns among darker evergreens on the far shore of Lac Beauvert. Not a large lake, its blue surface calmly reflects high piled clouds and lovely Mt. Edith Cavell. This is Jasper, the resort, polished, attractive, unbelievably comfortable. A short distance beyond is the little village of Jasper with its quaint shops and its Totem pole.

This is a far northern spot where daylight lingers until late at night. If you prefer, camp out. Roll in blankets and watch the smoke from an all night campfire lie low over the water as if held by an unseen hand until it thins and vanishes. You can fish, of course. Only the limits of your vacation will tear you away from scenes that writers are unable adequately to describe.

However, to complete your journey, you must go back to the junction near Lake Louise where, you remember, we swerved from the Trans-Canada Highway to take the Banff-Jasper Road. Instead of turning north, you continue west. The beauties of Lake Louise, a mile high and mirroring the ice-colors of Victoria Glacier, are world-famous. But it is the new road you want to travel. You reach it at Golden and will be on it until you come to Revelstoke. This bit of highway closes the last gap in a direct artery between Lake Superior and the Pacific Ocean.

As long ago as 1927, the Canadian Government completed a road through the Rocky Mountains from Banff, across the Kicking Horse Pass and Yoho National Park to connect with the Kicking Horse Canyon Road from Golden. At about the same time, a scenic highway was built from the west up the Fraser River Valley as far as Revelstoke. Between these links rose the Selkirk Mountains, most formidable. Various construction plans were abandoned because of the difficulties they presented, until the plan of following the great northern bend of the Columbia River was adopted. This is the new highway, construction of which began at Golden in 1929. It is 193 miles long and known in Canada as the "Big Bend Highway."

"The engineers had to match their skill against many obstacles," said Robert J. C. Stead of the Canadian National Parks Bureau. "Frequently it was necessary to blast through solid rock and at times to make a side hill cut high on the slope of the mountain."

This Big Bend section, like the Banff-Jasper Road, passes through a region rich in history and romantic adventure. Here traveled the same voyageurs, explorers, and pioneers who struggled through the northern passes; here also was difficult passage made to the sea. With the fascination of these old memories intriguing him, the motorist of today travels in comfort within sight of snowfields, glaciers, and jeweled mountain lakes.

Thus a new world opens—a sizeable bit of Heaven.

The Banff-Jasper Highway directly connecting, as it does at Banff, with the main travel arteries of the United States north from eastern Washington and northern Idaho by means of United States Highway Number 95, and north from Glacier Park by way of Calgary, brings the wild grandeur of far northern Jasper Park within easy distance of our inter-mountain West.

The Big Bend Highway makes complete a spectacular drive from Vancouver and Victoria in Pacific Coast British Columbia to the regions of Banff and Lake Louise, making possible a loop trip from Mt. Rainier or Seattle, east through Spokane, north to Banff, and then west again to Vancouver and south to Seattle.

No matter where on this globe you have been before; no matter what you have read of mountains and glaciers; no matter what you have hoped to see, you will not be disappointed at what lies along the Jasper road.

An Alien in Brazil

(*Continued from page* 336)

In our next step we used eucalyptus as fence posts. The railroads of Brazil are obliged by law to fence their rights-of-way and as the Paulista owns about 1,000 miles of line it is easy to imagine the number of fence posts needed. Posts of eucalyptus are largely employed for this use today, not only for new fences but also for replacements.

Identical experiments were made with piles for foundations and with poles for telephone, telegraph and electric service. In all these applications eucalyptus bore itself admirably and it is today largely used for these purposes by the Paulista company and the other railroad companies. Suffice it to say that its Forest Service has furnished the Paulista and other private enterprises 262,517 piles and poles of a total length of 1,100,000 meters, or approximately 3,575,000 feet.

Some years after these experiments we turned our attention to a trial of eucalyptus in the manufacture of paper. Prior experiments made by the Australians seemed to have determined that eucalyptus would not serve for the manufacture of pulp, neither mechanical nor chemical, either because of the shortness of its fibers or because of the texture or color of the wood. In 1925, for the third time I came to the United States, bringing with me from Rio Claro four logs, two each from two species of eucalyptus, from trees thirteen years old which I had planted. The necessary experiments were performed at the Forest Products Laboratory at Madison, Wisconsin, where I had the inestimable cooperation of all the scientists of that famous institution. We obtained several qualities of paper from eucalyptus including printing paper, which was contrary to general expectation. This latter served for a printing of a part of the edition of the *Wisconsin State Journal* of December 30, 1925.

In Sao Paulo, a paper mill of the firm Gordinho Braune S/A has been working with cellulose or pulp from eucalyptus since March, 1927. Papers for writing and printing are made using twenty-five to thirty per cent of bleached pulp from eucalyptus. This plant also makes paper with higher content of eucalyptus cellulose, reaching as high as sixty per cent. It can be seen from this that all the applications of eucalyptus wood that have been tried in Sao Paulo have already advanced beyond the experimental stage.

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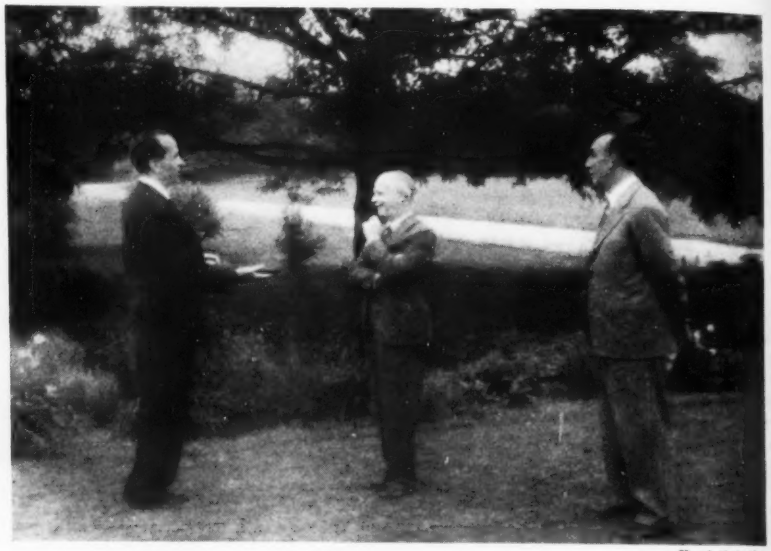
The most important result realized by the Forest Service of the Paulista company was, without doubt, the example and the provocative stimulation not only in Sao Paulo but in the whole of Brazil. Today the Brazilian Forest Code compels all the industries that use wood as fuel to reforest the lands utilized in the proportion of twenty per cent of their annual consumption of fuel wood, taking as an average a production of 100 cubic meters, or twenty-eight cords an acre. However, long before the requirements of the Code, large utilization of eucalyptus had begun in Brazil. In the state of Sao Paulo all the railroad companies owned forest nurseries and plantations of eucalyptus. The first to follow the example of the Paulista company was the Mogyanna Railroad Company, which actually has 11,000 acres of lands on which 5,472,000 eucalyptus are already planted. The Sorocabana Railroad, belonging to the State of Sao Paulo, created its own service of reforestation and owns for this purpose a total of 5,512 acres and 3,592,000 eucalyptus trees. The Araraquara Railroad Company, also belonging to the State of Sao Paulo, installed an identical service two years ago and already has a plantation of 1,000,000 eucalyptus trees and has acquired 19,170 acres of land for planting. Even a small company, the Itatibense Railroad, has a plantation of 210 acres and 200,000 eucalyptus for its locomotives. This company has only twelve miles of line.

It is not only in the State of Sao Paulo that the influence of the Paulista company makes itself felt. A sum of $135,000 in the budget of the Ministry of Transportation for the current year was set aside for the installation of forest nurseries on various federal railroads. These are Brazil Central, Northwest of Brazil, Goyas, Cearense Transportation, and Brazilian Eastern.

After the State of Sao Paulo, the Brazilian state that gave the greatest impetus to reforestation is Rio Grande do Sul where there must be more than 40,000,000 eucalyptus planted today. There also the railroad companies created departments for reforestation service many years ago and they maintain various plantations along their lines.

A curious and eloquent fact is noted in a late statistical publication of the Secretary of Agriculture of Sao Paulo. For census purposes the State was divided into ten agricultural districts. At the districts where the forest plantations of the Paulista company are situated the total of planted eucalyptus covers eighty-one per cent of all forest cultivations in Sao Paulo, which demonstrates clearly the influence exercised by the work of that company. The Paulista company actually owns 21,000,000 growing eucalyptus and has acquired the land to increase this to 35,000,000 by additional plantings at the rate of 2,500,000 trees a year.

A problem remains for us to solve, however, and that is the use of eucalyptus for ties. Because of the special structure of its wood, trees of less than thirty years of age and of diameter less than three feet split when sawed, and the ties have a tendency to crack at the ends. At first we thought that this defect was inherent only in eucalyptus, but we have since learned that the defect is common to a great number of hardwoods. Various methods have been tried in the United States to overcome this characteristic and on this my fifth visit I hope to obtain information that will throw light on the subject.



Frank Swingle

Dr. Edmundo Navarro de Andrade (center) being presented with the Meyer Medal for distinguished services in plant introduction, awarded by the American Genetic Association. The presentation was made by B. Y. Morrison, Chief of the Plant Introduction Service, United States Department of Agriculture. Minister Plenipotentiary of Brazil to Canada, the Hon. Joao Alberto Lins de Barros, is shown at right. The award was made at Washington, D. C., on June 2.

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